

LOCAL SUBWATERSHED STUDY REPORT

HEALEY GORE – 12879 THE GORE ROAD
RESIDENTIAL SUBDIVISION
ALCAN HOLDINGS INC.

TOWN OF CALEDON

PROJECT 2023-5342

MARCH 2026



Revision	Description	Prepared		Approved	
		By	Date	By	Date
0.0	Draft	Schaeffers	Feb 2026	Team	Mar 2026
1.0	1 st Submission	Schaeffers	March 2026	K. Shahbikian	Mar 2026

Executive Summary

Authors

This Local Subwatershed Study was prepared with input from SGL Inc (planning), GEI Consultants Canada Ltd. (natural heritage and fluvial geomorphology), Soil Engineers Ltd. (hydrogeology and geotechnical), and Schaeffers & Associates Ltd. (engineering, water resources).

Background

Alcan Holdings Inc. has retained Schaeffers & Associates Ltd. (SCE) to lead the completion of the Healey Gore Local Subwatershed Study (LSS). The Healey Gore Area (herein referred to as the Subject Lands) is approximately 39 ha in size is bound to the west by Gore Road, north by Healey Road, south by Mayfield, and east by Humber Station Road. The Subject Lands are proposed to be developed into the residential subdivision. The existing lands are dominated by agricultural lands. The LSS serves to create a sustainable development plan for the Subject Lands in Caledon by protecting and enhancing the natural and human environments by implementing the direction, targets, criteria and guidance of the Region of Peel’s Scoped Subwatershed Study. The LSS components are organized into three phases. The results of each phase of study are presented in this document.

Natural Heritage and Fluvial Geomorphology

GEI Consultants Canada Ltd. (GEI) completed a multi-phase natural heritage and fluvial geomorphology review for the Subject Lands in Caledon, Ontario, on behalf of Alcan Holdings Inc., to support the LSS process. The Subject Lands, which consists of the property owned by Alcon Holdings Inc., are bound to the west by Gore Road, north by Healey Road, south by Mayfield, and east by Humber Station Road. The Natural Heritage (NH) Study Area includes the Subject Lands and the surrounding 120 m of adjacent lands. This study contributes to the broader planning process for the Region of Peel’s Settlement Area Boundary Expansion (SABE) lands by identifying and evaluating natural heritage constraints and opportunities to inform development and conservation planning.

As part of Phase 1, GEI delineated the Existing Natural Heritage System (NHS) through desktop review and ecological field studies conducted between 2022 and 2025. The NHS delineation was based on the presence and extent of natural heritage features such as woodlands, wetlands, watercourses, and other supporting features, natural hazards, and ecological setbacks. The Existing NHS was compared to the Preliminary NHS identified in the SABE Scoped Subwatershed Study (Wood et al. 2022), which outlined high- and medium-constraint features and established enhancement and linkage goals to support a connected, resilient system. Information collected during Phase 1 formed the basis for identifying key natural heritage features and their ecological features potentially impacted by future development and provided a baseline for the subsequent phases of the study.

In Phase 2, GEI assessed the potential direct, indirect, and induced impacts to the Existing NHS associated with the proposed development. Medium Constraint watercourse WHT1(6)4-1, which provides direct fish habitat, is proposed to be realigned on the Subject Lands, maintaining the existing upstream and downstream tie-in points at the property boundary. The realignment is expected to result in substantial ecological and biophysical enhancements relative to the deteriorated conditions of the feature. Approximately 268 m² of wetland is present along the existing watercourse; the proposed realignment has been designed to incorporate a net increase in the area of wetland on the Subject Lands.

The development will result in the direct removal of Mitigation HDF WHT1(6)3-1 (which includes a total of 86 m² of wetland). The flow from this feature will be redirected into the realigned watercourse corridor of WHT1(6)4-1. An overall increase in wetland is expected due to the proposed wetlands within the realigned corridor. In addition, a clean flow collection system has been designed to retain the hydrological inputs provided by the existing WHT1(6)3-1 feature that support a downstream meadow marsh wetland.

Indirect and induced effects, such as changes to hydrology, construction-related disturbances, and increased anthropogenic activity resulting from future occupancy, were also considered. Mitigation measures have been proposed to avoid, minimize, or manage these potential impacts,

including erosion and sediment control (ESC), stormwater management (SWM) measures designed to maintain hydrological balance, construction best practices, installation of rear-lot fencing (without gates) along residential interfaces with the NHS, and the distribution of educational brochures to homeowners. These measures aim to minimize disturbance to retained features and reduce long-term degradation following occupancy.

To address the realignment of the watercourse and the removal of the HDF and small riparian wetland features, a conceptual restoration and enhancement plan will be developed to support long-term ecological function and improve the performance of the Proposed NHS. The replication wetlands within the realigned channel will be designed to support more complex habitat structure, and native species assemblages. Outside of the Draft Plan footprint, all currently non-vegetated areas or fallow agricultural fields in various states of succession within feature setbacks and/or within the Greenbelt Plan Area will be seeded with a native seed mix.

The new channel has been designed by GEI using fluvial geomorphic principles, with the goal of restoring natural channel processes, improving aquatic and riparian habitat conditions, extending wet and dry periods, and integrating wetland and riparian features into a cohesive ecological corridor. The stream length within the realigned channel will be slightly longer than the existing watercourse resulting in an overall increase in area and associated habitat. Integrated online and riparian wetlands will provide water retention, sediment capture, and diverse hydroperiods to support a range of vegetation communities. Additional habitat enhancements—such as pools, woody debris, native plantings, raptor poles, and rock piles—will increase biodiversity and ecological value, while the channel’s dimensions and meander belt width are designed to support long-term stability and function.

Collectively, the restoration and enhancement components along with the retained natural heritage features will form the Proposed NHS, which refines and builds upon the Existing NHS by incorporating ecological design elements and improved landscape connectivity. These enhancements will improve patch size, habitat heterogeneity, and movement corridors for both aquatic and terrestrial species. Compared to the Existing NHS, the Proposed NHS is expected to

support a wider range of native species and better withstand the pressures of urban development and climate change.

Following approval of a conceptual restoration and enhancement plan by the relevant reviewing authorities, a detailed design brief will be prepared by a Certified Ecological Restoration Practitioner (CERP) and a Landscape Architect (LA) to guide implementation. This brief will include specific design drawings, species lists, and implementation sequencing. It will also outline a comprehensive monitoring program to evaluate restoration success and an adaptive management strategy to address unexpected outcomes. The monitoring and adaptive management plan—outlined conceptually in Phase 3—will include site-specific performance targets, clear triggers for action, and responsive management measures. Consideration will be given to long-term ecological resilience under changing environmental conditions, including invasive species control, vegetation survivorship, channel stability, and potential human encroachment.

Together, the proposed mitigation measures, restoration design, and monitoring and adaptive management framework support a development approach that balances planning objectives with environmental considerations. This integrated strategy aims to protect the Healey Gore – Humber Station West NHS and its ecological functions over the long term, with the goal of achieving a net ecological gain and contributing to the Town of Caledon’s broader goals for sustainable growth and community development.

Hydrogeology

As a part of the Local Subwatershed Study, the following assessments have been completed, and the results are presented in the report titled “*Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon*”, Reference Number: 2405-W038, Rev.1, dated March 3, 2026, prepared by Soil Engineers Ltd.

Servicing and Stormwater Management

The proposed development is set to include 128 detached houses, 430 semi-detached units, and

277 townhouse units with a total estimate population of 3361. The proposed development is expected to be serviced by Pressure Zone 6, ensuring adequate water supply and pressure. Connectivity to the existing municipal system will be established through future infrastructure. Water supply infrastructure around the subject site is under design and is anticipated to be tendered by early 2027. The design demonstrates that the system at the time of construction will be capable of addressing average, peak hour, maximum day, and fire flow demands. A combined maximum demand plus fire flow of 221.66 L/s is required for the subject site.

Sanitary flows from the development will be managed through internal sewers along the proposed road network. The ultimate servicing strategy for these flows will involve utilizing the new proposed sanitary sewer on Healey Road. The sanitary servicing plan has designed in conformance with the Region of Peel's design criteria, projecting an estimate total peak flow of 47.57 L/s. The construction of sanitary sewers connecting the subject lands to the proposed sanitary sewer on Healey Road is under detail design and expected to be constructed by 2027.

Stormwater will be managed through a dual-drainage system, where minor flows are conveyed via sewers and major flows are handled by overland routes. SWM pond will be implemented to provide water quality, erosion, quantity, and volume control through filtration. The SWM pond will ensure erosion control via the detention of the 25 mm rainfall event for 48 hours. Quantity control will be provided for the 2-year to 100-year and regional storm event by the SWM Pond. The water quality control will be provided through a treatment train approach, where the permanent pool within the SWM pond is sized to provide 70% TSS removal; while the filter bed will provide the additional 60% TSS removal, which results in a total 88% TSS removal. In addition, the filter bed will be sized to satisfy the 27mm filtration volume requirements under the MECP Consolidated Linear Infrastructure – Environmental Compliance Approval (CLI-ECA) criteria. A water balance analysis indicates that the development aims to meet pre-development water balance conditions, with the infiltration deficient being addressed by LID measures such as Infiltration trenches in rear yards. A feature-based water balance analysis conducted using the A×C method confirms that post-development runoff contributions to Wetland WT-1, located outside

the southeast corner of the site, can be maintained at levels comparable to pre-development conditions, with confirmation to be completed through continuous hydrologic modelling at the detailed design stage.

Hydrology and Floodplains

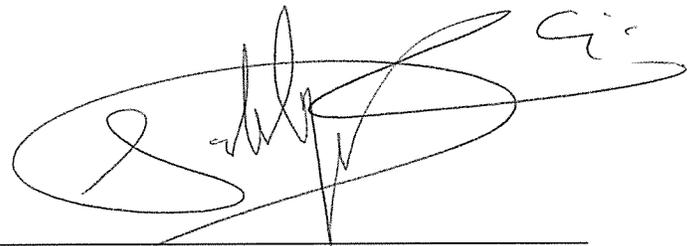
The Subject Lands are located within the West Humber River subwatershed, falling under the jurisdiction of the Toronto and Region Conservation Authority (TRCA). Directly downstream of the site are the Gore Road Tributary and the West Humber River. The development proposes the development of both residential and parkland land uses, including a channel realignment near Healey Road.

Hydrologic modelling was conducted using the TRCA's Visual OTTHYMO (VO) model for future uncontrolled conditions. The TRCA model was updated to reflect the proposed land use changes and refined drainage patterns within the study area. The model scenarios include the refined existing conditions model, a post-development model for the Subject Lands alone, and a broader future conditions model which include the lands of the Bolton West Secondary Plan area. Both models representing post-development conditions are still currently under assessment. The results of this assessment will be shared once complete. To support the hydraulic assessment, a HEC-RAS model was developed by joining two existing TRCA models. The 6-hour 100-year storm and regional storm peak flows were used as flow inputs. Floodplain figures were generated for the existing conditions. The Regional Storm was found to be the regulatory storm.

A comparison of results between the model scenarios will be completed to assess the impact of development. The results will confirm the need for regional controls at the proposed SWM pond. The current FSSR has proceeded with the assumption for the need of a regionally controlled SWM pond.



Koryun Shahbikian, P.Eng., LLM, M.Eng.
Partner
Schaeffers Consulting Engineers



Sukhpreet Saini, B.A.Sc., E.I.T.
Water Resources Analyst
Schaeffers Consulting Engineers

Table of Contents

	Page
1.0 Introduction.....	15
1.1 Study Areas	17
1.1.1 Natural Heritage Study Area	17
1.1.2 Hydrologic Study Area.....	17
1.2 Background Studies and Guidelines.....	17
Phase 1 – Subwatershed Characterization and Baseline Inventory	20
2.0 Natural Heritage	20
2.1 Scope Overview.....	20
2.2 Natural Heritage Planning Context and Legislative Framework	21
2.2.1 Provincial Planning Statement.....	21
2.2.2 Greenbelt Plan	23
2.2.3 Settlement Area Boundary Expansion Studies.....	24
2.2.4 Peel Regional Official Plan	29
2.2.5 Town of Caledon Official Plan.....	34
2.2.6 Toronto and Region Conservation Authority	39
2.2.7 Endangered Species Act, 2007 and Bill 5	41
2.2.8 Fish and Wildlife Conservation Act, 1997	42
2.2.9 Fisheries Act, 1985	42
2.2.10 Migratory Birds Convention Act, 1994.....	43
2.3 Gap Analysis and Data Collection Approach and Methods.....	43
2.3.1 Background Review	44
2.3.2 Ecological Field Surveys	45
2.4 Biophysical Characterization.....	57
2.4.1 Physiography	57
2.4.2 Landscape Ecology.....	58
2.4.3 Natural Heritage Areas Mapping.....	59
2.4.4 Wildlife Background Review	59
2.4.5 Vegetation and Landscape Survey Results.....	64
2.4.6 Wildlife Survey Results.....	73
2.4.7 Aquatic Survey Results	78
2.5 Analysis of Ecological and Natural Heritage Significance	86

2.5.1	Provincial Planning Statement.....	86
2.5.2	Greenbelt Plan	100
2.5.3	Peel Region and Town of Caledon Official Plans	101
2.5.4	Toronto and Region Conservation Authority	104
2.5.5	Species at Risk Requirements.....	104
2.6	Existing Natural Heritage System	106
2.6.1	Settlement Area Boundary Expansion Preliminary Natural Heritage System 106	
2.6.2	Healey Gore Existing Natural Heritage System	107
3.0	Fluvial Geomorphology.....	114
3.1	Historical Assessment	116
3.2	Field Investigations	117
4.0	Natural Hazards.....	119
4.1	Meander Belt Delineation.....	119
4.2	Toe Erosion Allowance	121
4.3	Erosion Analysis.....	122
5.0	Groundwater	123
5.1	Hydrogeological Assessment	123
5.2	Water Balance and Groundwater Recharge	127
5.3	Water Supply Wells.....	127
5.4	Monitoring.....	128
6.0	Surface Water	128
6.1	Hydrologic Assessment	128
6.1.1	Existing Setting.....	128
6.1.2	Stormwater Management Criteria	129
6.1.3	Existing Flows	131
6.2	Wetland Water Balance Risk Evaluation	133
6.3	Surface Water Monitoring.....	134
6.4	Municipal Servicing	135
6.4.1	Water Supply Infrastructure	135
6.4.2	Sanitary Infrastructure	136
	Phase 2 – Impact Assessment.....	137
7.0	Natural Heritage	137

7.1	Scope Overview.....	137
7.2	Natural Environment Mitigation Hierarchy	138
7.3	Impact Assessment and Mitigation Measures	139
7.3.1	Wetlands	140
7.3.2	Woodlands	146
7.3.3	Significant Valleylands.....	148
7.3.4	Significant Wildlife Habitat.....	151
7.3.5	Fish Habitat.....	152
7.3.6	Habitat of Endangered and Threatened Species	159
7.3.7	Migratory Birds	160
7.3.8	Potential Induced Impacts	161
7.4	Conceptual Restoration and Enhancement Strategy.....	164
7.4.1	Overview of the Settlement Area Boundary Expansion Natural Heritage System	165
7.4.2	Natural Heritage Features Proposed for Removal	166
7.4.3	Ecological Offsetting Approach	167
7.4.4	Ecological Restoration Goals and Objectives	169
7.4.5	Conceptual Ecological Restoration Plan	170
7.4.6	Next Steps and Implementation.....	173
7.5	Proposed Natural Heritage System.....	174
8.0	Fluvial Geomorphology.....	177
8.1	Erosion Mitigation Assessment.....	177
8.2	Proposed Conceptual Corridor Design.....	177
8.2.1	Overview of Corridor Design.....	177
8.2.2	Overview of Channel Design	179
9.0	Groundwater	181
9.1	Hydrogeological Assessment	181
9.2	Water Balance and Groundwater Recharge	185
9.3	Water Supply Wells.....	185
9.4	Monitoring.....	185
10.0	Surface Water	186
10.1	Hydrologic Assessment	186
10.2	Hydraulic Assessment	187

10.3 Climate Impact Assessment	187
10.3.1 Qualitative Review	188
11.0 Municipal Servicing.....	192
11.1 Water Supply Infrastructure	192
11.2 Sanitary Infrastructure	193
11.3 Grading.....	194
Phase 3 – Management, Implementation and Monitoring.....	195
12.0 Management and Implementation	195
12.1 Stormwater Management.....	195
12.1.1 Stormwater Management Strategy	196
12.1.2 Water Balance.....	197
12.1.3 CLI-ECA Requirements	200
12.2 Groundwater	201
12.3 Construction	201
13.0 Monitoring Plan.....	202
13.1 Ecological Performance Indicators.....	202
13.2 Monitoring Scope and Timeline.....	203
13.2.1 Baseline Monitoring	204
13.2.2 Construction-Phase Compliance Monitoring	205
13.2.3 Post-Development Monitoring	208
13.3 Monitoring Reports	210
14.0 Adaptive Management Plan.....	210
14.1 Natural Heritage	210
14.1.1 Woody Species Survivorship.....	211
14.1.2 Invasive Species	211
14.1.3 Human Encroachment	211
15.0 Future Study Requirements.....	211
16.0 Conclusion	213
17.0 References.....	214

List of Tables

Table 2-1 Stem Density Assessment – CUW1	72
Table 2-2 Stem Density Assessment – THDM2-6	72
Table 2-3 Native Stem Density Assessment – THDM2-6.....	73
Table 4-1. Empirical Meander Belt Delineation Results	120
Table 6-1 Humber River Unit Flow Equations.....	130
Table 6-2: Regional Storm Existing Downstream Peak Flows	132
Table 6-3: SWM Pond Allowable Release Rates Summary.....	133
Table 6-4: Wetland Area x Runoff Coefficient Pre vs. Post development comparison	134
Table 8-1 Empirical Corridor Sizing Results.....	179
Table 10-1: Summary of Peak Flows in the SCE Modified Existing Scenario (m ³ /s)	186
Table 10-2: Summary of Modelled Historical and Future Climate for each Climate Period under the SSP2-4.5 Climate Scenario	188
Table 10-3: Summary of Modelled Historical and Future Climate for each Climate Period under the SSP5-8.5 Climate Scenario	189
Table 10-4: Comparison of 2071-2100 Against 1961-1990 for SSP5-8.5 and SSP2-4.5 Scenarios	190
Table 11-1: Total Water Supply Servicing Demands	193
Table 11-2: Sanitary Servicing Demands	194
Table 12-1: Post-Development Drainage Areas	197
Table 12-2: Active Storage Requirements	197
Table 12-3: Permanent Pool Requirements	197
Table 12-4: Erosion Control Summary.....	197
Table 12-5: Water Balance Parameters.....	198
Table 12-6: Water Balance Summary.....	199
Table 12-7: CLI-ECA Summary.....	200
Table 15-1: Supporting Studies	212

List of Figures

Figure 1.1: Location Plan.....	16
---------------------------------------	-----------

List of Appendices

- Appendix A.1.1: Natural Heritage Figures
 - Appendix A.1.2: Natural Heritage Tables
 - Appendix A.2.1: Fluvial Geomorphology Figures
 - Appendix A.2.2: Historical Record
 - Appendix A.2.3: Photographic Record
 - Appendix A.3.1: Slope Stability Report – to be provided (SEL)
 - Appendix A.3.2: Geotechnical Investigation Report (SEL)
 - Appendix A.3.3: Draft Floodplain Report (SCE)
 - Appendix A.4.1: Hydrogeological Report (SEL)
 - Appendix A.4.2: Water Balance Report – to be provided (SEL)
 - Appendix A.4.3: Private Wells – to be provided (SEL)
 - Appendix A.5.1 Downstream Analysis – to be provided (SCE)
 - Appendix A.5.2 Draft FSSR (SCE)
 - Appendix A.5.3 WWBRE
 - Appendix A.6: Topographic Survey (RPE)
 - Appendix A.7: Draft Plan (KLM)
-
- Appendix B.1: Natural Heritage Figures
 - Appendix B.2: Channel Design Figures
 - Appendix B.3: Engineering Drawings

1.0 Introduction

The Gore Healey lands, referred to as the “Subject Lands”, is a proposed residential subdivision in Caledon located west of Gore Road and south of Helaey Road. A Secondary Plan and Draft Plan of Subdivision are being completed concurrently. The property is registered as part of Lot 5, Concession 4, Albion, Town of Caledon within the Regional Municipality of Peel. Please refer to **Figure 1** for the location plan.

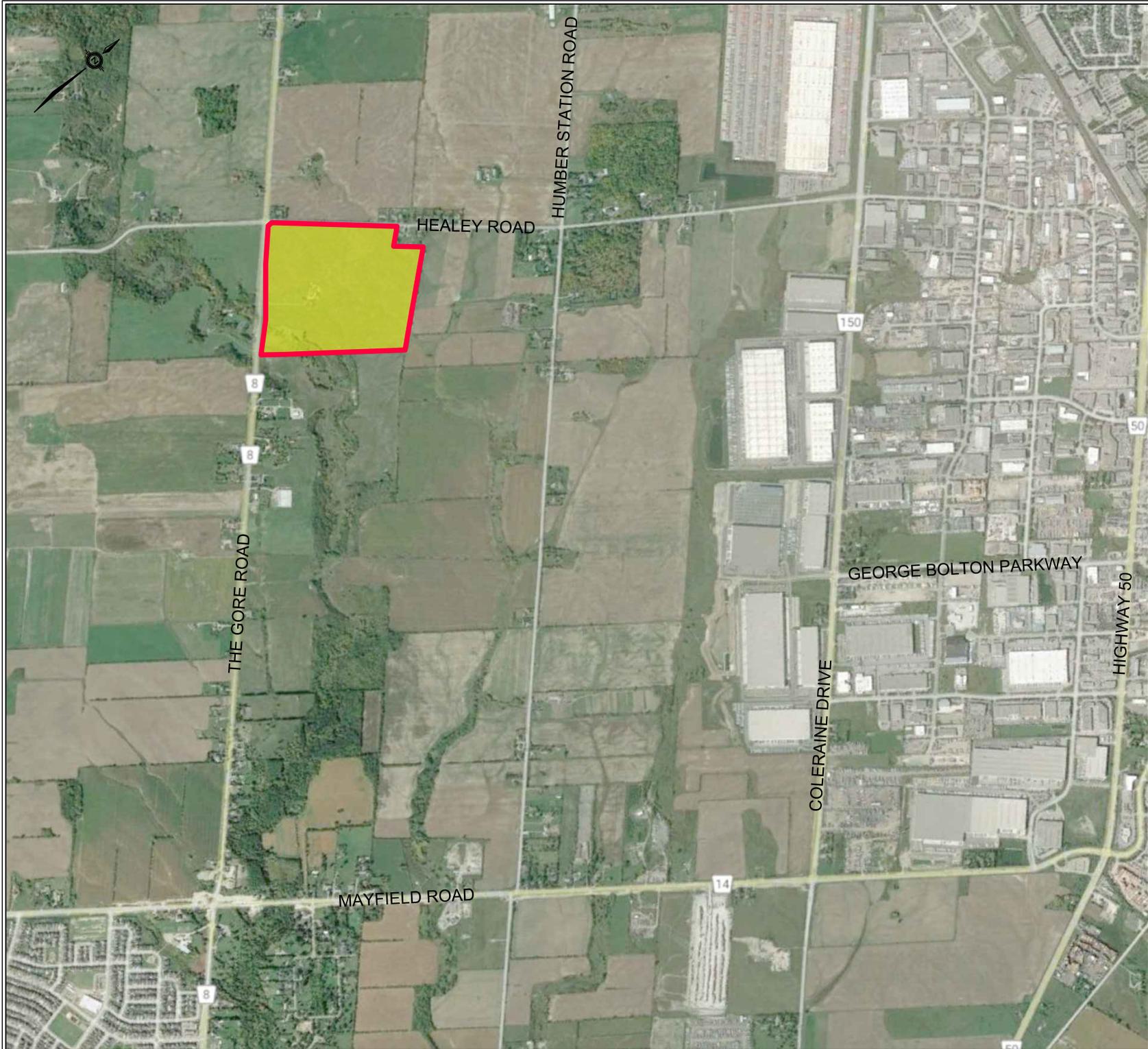
The purpose of the LSS is to create a sustainable development plan for the Subject Lands in Caledon by protecting and enhancing the natural and human environments by implementing the direction, targets, criteria and guidance of the Region of Peel’s Scoped Subwatershed Study (SSS) (Wood et al. 2022). The LSS confirms, refines and implements a Natural Heritage System (NHS) and the water resources management approach to protect, rehabilitate, and enhance the natural and water-based environments within the subject site area.

The proposed scope of work for the LSS is outlined in the Local Subwatershed Study Terms of Reference –Helaey Gore document (TOR), submitted to the Town and TRCA in July 2025.

The study components are organized into three phases, per the Town’s (2024) *Terms of Reference: Local Subwatershed Studies* (LSS TOR). The results of each phase are outlined in this document and are as follows:

- Phase 1 – Characterization of Existing Conditions and Baseline Inventory
- Phase 2 – Analysis, Impact Assessment, Mitigation and Recommendations
- Phase 3 – Implementation, Monitoring and Adaptive Management

The TRCA’s Environmental Impact Statement Guidelines (October 2014) and the TRCA’s Master Environmental Servicing Plan Guideline (March 2015) are applied to this LSS. The LSS also follows the requirements of the Region of Peel Official Plan, Town of Caledon Official Plan, (both the in-effect Official Plan and the Future Caledon Official Plan), and the TRCA.



HUMBER STATION VILLAGES
TOWN OF CALEDON

LEGEND

 SUBJECT LOCATION

 **SCHAEFFERS**
CONSULTING ENGINEERS
6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100 Email: general@schaeffers.com
www.schaeffers.com

FIGURE 1
LOCATION PLAN

1.1 Study Areas

There are several study components for which their study areas extend beyond the boundaries of the Subject Lands. The disciplines that have Study Areas that differ from the Secondary Plan Area are as described in the following sections.

1.1.1 Natural Heritage Study Area

The Natural Heritage Study Area (NH Study Area) consists of the Secondary Plan Area and the 120 m adjacent lands, as shown in **Figure 1 (Appendix A.1.1)**. The 120 m adjacent lands allow for the assessment of potential negative impacts on significant natural heritage features and functions in areas where development or site alteration is most likely to have an effect. Where property access to non-participating lands was not available, their characterization is based on air photos, background secondary sources, and surveys from publicly accessible areas.

1.1.2 Hydrologic Study Area

The Secondary Plan area is located within the West Humber subwatershed. The Hydrologic Study Area (HSA) will encompass the Secondary Plan area and extend to external drainage from lands upstream that flow through the Healey Gore area. The HSA will also include key flow nodes downstream of the Subject Lands area up to the confluence with the Main Humber River and the Gore Road Tributary at the Clairsville Reservoir. These flow nodes will be utilized to compare post-development flows to pre-development flows to assess potential impacts and develop mitigation plans specific to the Healey Gore area.

1.2 Background Studies and Guidelines

There are numerous studies, plans, guidelines, etc. that will provide input and guidance to the preparation of the LSS. The following outlines these studies:

- Provincial Planning Statement (PPS) (MMAH, 2024)

- Region of Peel Official Plan (2022);
- Region of Peel Settlement Area Boundary Expansion Study (SABE), (2022);
- Region of Peel Water and Wastewater Master Plan (2020);
- Region of Peel Environmental Assessment - Bolton Water and Wastewater Capacity Improvements (ongoing);
- Town of Caledon: Development Standards Manual (2019);
- In-effect Town of Caledon Official Plan (Office Consolidation 2024);
- Future Caledon Official Plan (Adopted May 2024, Awaiting Provincial Approval);
- Town of Caledon Growth Management Phasing Plan and Financial Impact Assessment Presentation (2024);
- Municipal Consolidated Linear Infrastructure Environmental Compliance Approvals, Ministry of Environment, Conservation and Parks (MECP), (June 2023);
- Development Charges Background Study – Consolidation Report, The Regional Municipality of Peel (Watson & Associates Economists Ltd., 2020)
- Species at Risk in Ontario (SARO) List, regulation to the Endangered Species Act, 2007 (ESA);
- Ministry of Natural Resources: Natural Heritage Reference Manual: Second Edition (OMNR 2010);
- Humber River Watershed Plan (TRCA, 2008) and any on-going updates including the Humber River Watershed Characterization Report (TRCA, 2023);
- Humber River Watershed Plan Implementation Guide (TRCA, 2008);

- Humber River State of the Watershed Reports (TRCA, 2008);
- Final Report Humber River Hydrology Update (TRCA, 2018);
- Listen to Your River: A Report Card on the Health of the Humber River Watershed (TRCA, 2007);
- Humber River Fisheries Management Plan (MNR and TRCA, 2005);
- TRCA Master Environmental and Servicing Plan Guideline (TRCA, 2015);
- Evaluation, Classification, and Management of Headwater Drainage Features Guidelines (CVC & TRCA, 2014);
- TRCA Guidelines for Review of SWM Pond Location with Respect to Groundwater Conditions;
- TRCA Stormwater Management Criteria Document (TRCA, 2012);
- Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019);
- Crossings Guideline for Valley and Stream Corridors (TRCA, 2015);
- Channel Modification Design and Submission Requirements (TRCA, 2007);
- Technical Guidelines for Flood Hazard Mapping (TRCA and other Conservation Authorities, 2017);
- TRCA/CVC Low Impact Development Stormwater Management Planning and Design Guide (February 2024);
- Geotechnical Engineering Design and Submission Requirements (TRCA November 2017);
- Hydrogeological Assessment Submissions- Conservation Authority Guidelines to Support Development Applications (Conservation Ontario 2013);
- Technical Guide for River & Stream Systems: Erosion Hazard Limit (MNRF, 2002);

Phase 1 – Subwatershed Characterization and Baseline Inventory

Phase 1 includes the characterization of existing conditions and development of a baseline inventory. This analysis records, characterizes, and assesses natural hazards and natural heritage features and functions within the Study Area. The analysis provides recommendations for the protection, conservation, and management of natural hazards and natural heritage features within the Secondary Plan Area. Phase 1 characterizes the resources associated with each discipline and across disciplines to accomplish the following, as per the Town’s LSS TOR.

2.0 Natural Heritage

2.1 Scope Overview

GEI Consultants Canada Ltd. (GEI) conducted a natural heritage review of the Natural Heritage Study Area (NH Study Area), which consists of the Subject Lands and adjacent lands within 120 m, as illustrated in **Figure 1 (Appendix A.1.1)**. The purpose of this Phase 1 natural heritage study is to support the LSS process by identifying and characterizing the natural heritage features within the NH Study Area and assessing their significance and ecological function.

Through detailed ecological investigations, including feature boundary staking exercises, this study defines the Existing Natural Heritage System (NHS) based on the greatest extent of natural features and hazards, along with their associated buffers. The Existing NHS mapping establishes the natural heritage constraints and opportunities for development within the Subject Lands.

This study also provides contextual information on natural heritage policies relevant to the future proposed development of the Subject Lands, including the Provincial Planning Statement (PPS; MMAH, 2024) and associated provincial guidance in the *Natural Heritage Reference Manual* (NHRM; MNR 2010), the Peel Regional Official Plan (2022), the Town of Caledon’s Official Plan (Future Caledon: Our Official Plan, 2025), and Ontario Regulation (O. Reg.) 41/24, administered by the Toronto and Region Conservation Authority (TRCA).

Key components of this study include:

- Review of natural heritage background information, legislation, regulations, and policies relevant to the NH Study Area;
- Ecological field investigations completed to identify and delineate natural heritage features and assess species presence in the NH Study Area;
- Biophysical characterization of the NH Study Area;
- Evaluation of the significance of the identified natural heritage features; and
- Mapping of the Existing NHS.

2.2 Natural Heritage Planning Context and Legislative Framework

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

- PPS (MMAH, 2024) under the *Planning Act*, 1990;
- Greenbelt Plan (MMA, 2017) under the *Greenbelt Act*, 2005;
- Peel Regional Official Plan (2022);
- Town of Caledon Official Plan (2025);
- O. Reg. 41/24 under the *Conservation Authorities Act*, 1990, administered by the TRCA;
- Provincial *Endangered Species Act*, 2007 and Bill 5;
- Federal *Fisheries Act*, 1985;
- Federal *Migratory Birds Convention Act*, 1994.

2.2.1 Provincial Planning Statement

The new PPS (MMAH 2024) came into effect on October 20, 2024. This document replaces the previous Provincial Policy Statement (2020) and *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (2020). Many of the Natural Heritage considerations remain the same. In general, the PPS provides policy direction on matters of provincial interest related to land use planning and development. It “supports a comprehensive, integrated and long-term approach to

planning.” The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

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

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

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

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

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

Province or based on municipal approaches which achieve the same objectives.”

2.2.2 Greenbelt Plan

The Greenbelt Plan (MMA, 2017) was created to provide permanent protection for the agricultural land base and the ecological and hydrological features, areas, and functions within the Greenbelt Plan area within the Greater Golden Horseshoe.

As described within Section 2 of the Greenbelt Plan (MMA, 2017), the Greenbelt Plan Area includes lands within the Oak Ridges Moraine Area, the Niagara Escarpment Plan Area, the Parkway Belt West Plan Area, and lands designated Protected Countryside and Urban River Valley.

According to *Schedule 1: Greenbelt Area* and as shown in **Figure 2 (Appendix A.1.1)**, the southwest portion of the NH Study Area is located within the Greenbelt Plan area and is designated Protected Countryside. Per *Schedule 4: Greenbelt Natural Heritage System*, these lands are also located within the Greenbelt Plan NHS. Greenbelt Plan NHS is not a land use designation; rather, it is an overlay on top of the Protected Countryside designation.

The Greenbelt Plan sets out policies to protect key natural heritage features (KNHFs), key hydrologic features (KHF), and key hydrologic areas (KHAs).

KNHFs include the following:

- Habitat of Endangered and Threatened species;
- Fish habitat;
- Wetlands;
- Life Science ANSIs;
- Significant valleylands;
- Significant woodlands;
- SWH (including habitat of Special Concern species);
- Sand barrens, savannahs, and tallgrass prairies; and
- Alvars.

KHFs include the following:

- Permanent and intermittent streams;
- Lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

KHAs include the following:

- Significant groundwater recharge areas;
- Highly Vulnerable Aquifers; and
- Significant surface water contribution areas.

Per Section 3.2.5 of the Greenbelt Plan, development and site alteration are prohibited within KNHFs, KHFs, and their associated Vegetation Protection Zones (VPZs), except for uses such as infrastructure, conservation, or flood control projects that meet the criteria set out in the plan. For proposed development or site alteration within 120 m of KNHFs or KHFs, a Natural Heritage Evaluation or Hydrological Evaluation (or similar study) must demonstrate that there will be no negative impacts on their ecological or hydrological functions and must also identify VPZs that are sufficient to protect the features and are maintained as natural, self-sustaining vegetation.

2.2.3 Settlement Area Boundary Expansion Studies

The SABE study conducted by the Region of Peel was used to inform the implementation of the 2022 Peel Regional Official Plan. The SABE study identified locations for new community and employment lands in the Town of Caledon to accommodate growth through 2051. The study also delineated the “Natural Environment System within New Community Areas,” integrating it into the Regional Official Plan policies and mapping for the “2051 New Urban Area.”

To support the SABE study and 2022 Peel Regional Official Plan and to better understand environmental conditions, impacts, and management opportunities, two technical documents were prepared by Wood Environment & Infrastructure Solutions Canada Ltd. (Wood): an Environmental Screening Report (Wood 2020) and a Scoped Subwatershed Study (SWS; Wood

et al. 2022; prepared in collaboration with consultants specializing in ecology, fisheries, hydrogeology, and stream morphology).

The SABE Scoped SWS technical document has three parts:

- Part A – Characterization
- Part B – Impact Assessment
- Part C – Implementation Plan

The NH Study Area for this LSS falls within the SABE study area, and as such, data from these reports were used to inform this LSS.

2.2.3.1 Environmental Screening Report (Wood 2020)

The SABE Environmental Screening Report (Wood 2020) initial study area analyzed all lands in the Region of Peel outside of existing settlement areas and the Greenbelt Plan Area. Natural features were categorized into three preliminary constraint levels:

- High Constraint: Mapped natural environment features and areas with existing designations or significance that afford them protection under current provincial or municipal plans/policies. Development is typically prohibited in these areas.
- Medium Constraint: Mapped natural environment features and areas that may, through further assessment, represent constraints to development or indicate potentially significant functions. This category also includes portions of non-provincial NHS outside of High Constraint features—typically corridors and linkages that may constrain development but require refinement through further study. Medium Constraint areas may be upgraded to High Constraint or determined to have little or no constraint as additional information becomes available.

- Low Constraint: Mapped natural environment areas that, based on current knowledge, do not preclude development but may influence land use planning (e.g., densities, development types). These areas may require additional studies, enhanced management, or other considerations that could increase development complexity or management needs.

2.2.3.2 Scoped Subwatershed Study (Wood et. al. 2022)

The preliminary high and medium constraint features identified in the SABE Environmental Screening Report were used to refine the focus study area for the SABE Scoped SWS (Wood et al. 2022):

- Preliminary High Constraint Features:
 - Provincially Significant Wetlands (PSWs)
 - Provincial NHSs, including the Greenbelt NHS within the Study Area
 - Significant woodlands (Core Woodlands, Region of Peel OP, 2022)
 - ANSIs
 - Environmentally Sensitive Areas (Region of Peel OP, 2022)
 - Significant valleylands
 - Other valleylands
 - Permanent and intermittent watercourses
- Preliminary Medium Constraint Features:
 - Other wetlands
 - Other woodlands
 - Other drainage features (e.g., headwater drainage features [HDFs])
 - Seepage areas and springs
 - Municipal NHSs

The SABE also identified a watercourse constraint ranking system. Medium constraint watercourses are typically characterized to have regulated attributes such as floodplains or unstable banks but are generally highly impacted and therefore may be realigned using natural channel design and other principles of environmental design. High constraint watercourses have been identified as high-quality systems that should not be re-located and replicated in a post-

development scenario. These features must remain open and protected in their present condition and locations, except for select instances where rehabilitation may be of benefit to the system.

The SABE Scoped SWS primarily relied on desktop data, and as such significance of natural heritage features was not always determined. This LSS obtained site-specific field data to assess high- and medium-constraint features.

2.2.3.2.1 Preliminary Natural Heritage System

The following NHS feature types were identified and integrated into the overall Preliminary NHS for the SABE Scoped SWS (Figure DA2-11b, Appendix D of Part C):

- Key Features – Features recommended for protection within a connected NHS:
 - Woodlands, wetlands, valleylands;
 - Environmentally Sensitive/Significant Areas;
 - SWH;
 - Fish habitat;
 - Provincially and regionally significant ANSIs;
 - Habitat for Endangered and Threatened Species;
 - HDFs classified as Protection or Conservation;
 - Key Natural Heritage Features & Key Hydrologic Features (Greenbelt Plan); and
 - Sand Barrens, Savannahs, and Grasslands (per provincial plans or ELC classifications).

- Supporting Features – Features requiring further assessment to determine if they meet Key Feature criteria or contribute to the NHS:
 - Woodlands, wetlands, valleylands;
 - Regionally significant Earth Science ANSIs;
 - HDFs identified as Mitigation;
 - Successional habitats; and
 - Open aquatic habitats.

- Other Features – Features requiring additional study to determine status within the NHS:
 - Woodlands;
 - Wetlands;
 - Successional habitats;
 - Open aquatic habitats; and
 - NHS Targets & Enhancement Goals.

Section 2.1.3 of Part C of the SABE Scoped SWS (Wood et al. 2022) technical document states:

*“Due to the scoped nature of the Scoped SWS, it is acknowledged that the areas mapped through this study **may be refined or confirmed through more detailed local levels of study.** This may **include features confirmation (category – Key, Supporting, Other), refined boundary delineation, and detailed implementation of the linkages, enhancement and mitigation measures (e.g., buffers) as informed by site-specific study (i.e., field work) subject to the recommendations of this study.** This report sets out the **framework and targets for implementation for the NHS and provides guidance to support subsequent phases of work.** System targets have a strong focus on enhancement through robust linkages and enhancement areas; **these targets are to be implemented through detailed studies and through policy.**” [emphasis added]*

The framework, targets, and guidance of the SABE Scoped SWS technical document are implemented through the policies of the Peel Regional Official Plan (2022) and the Future Caledon Official Plan (2025), discussed in **Sections 2.2.4 and 2.2.5.**

As recommended by the SABE Scoped SWS technical document, this LSS presents the results of site-specific field data collection and significance analysis for the natural heritage features of the NH Study Area, based on which the SABE Scoped SWS’s Preliminary NHS will be updated. This update will include confirmation of feature categories (i.e., Key, Supporting, Other) and a review and refinement of enhancement and linkage opportunities.

2.2.3.2.2 Natural Heritage System Targets and Enhancement Goals

The SABE Scoped SWS outlines recommended targets for the NHS within the SABE area:

- **Natural cover:** no net loss;
- **Wetlands:** no net loss of wetland cover; increase total wetland cover through NHS enhancements;
- **Valley and stream corridors:** no net loss of ecological and hydrological functions; increase natural cover within these corridors through enhancements;
- **Successional and open habitats:** Maintain important existing successional/open habitats contiguous to other features and areas of the NHS; increase representation and quality of open country habitats across the landscape through NHS enhancement opportunities; strive to create at least one habitat area with a minimum size threshold of 5 ha;
- **Aquatic:** achieve 75% naturally vegetated watercourse length through protection, enhancement or restoration;
- **Sand barrens, savannahs, grasslands:** protect these where they occur; and
- **NHS enhancements:** identify and distribute enhancement opportunities across the NHS to support a robust and sustainable system; increase natural cover by 30%.

2.2.4 Peel Regional Official Plan

The Peel Regional Official Plan (2022) was adopted by the Region of Peel Council on April 28, 2022, and approved by the Minister of Municipal Affairs and Housing (MMAH) on November 4, 2022. The Peel Regional Official Plan is intended to guide future planning activities within the Region and provide direction to those initiatives that aim to improve the existing physical environment. This plan also provides direction and support to local municipalities in the development of their Official Plans and future planning activities; however, as per Ontario Bill 23 (*More Homes Built Faster Act, 2022*) and Bill 185 (*Cutting Red Tape to Build More Homes Act, 2024*), the Peel Regional Official Plan has been, as of July 1, 2024, deemed to constitute an official plan of Peel's lower-tier municipalities: Caledon, Brampton, and Mississauga.

In 2022 the Region of Peel conducted the SABE study. The results of the SABE study were used to inform implementation of the 2022 Regional Official Plan. The SABE study identified locations

for new community and employment lands in the Town of Caledon to accommodate growth through 2051. The study also delineated the “Natural Environment System within New Community Areas,” integrating it into the Regional Official Plan policies and mapping for the “2051 New Urban Area.”

The majority of the NH Study Area is designated as “Urban System” and “2051 New Urban Area” in *Schedule E1: Regional Structure*. The Regional Official Plan directs urban development and redevelopment to Urban System areas. The southwestern portion of the NH Study Area, associated with the West Humber River, is also included within the regional “Greenlands System” per *Schedule C1: Greenlands System*, and is further identified as “Core Area” within the Greenlands System in *Schedule C2: Core Areas of the Greenlands System in Peel*. Figure 7: *Regional Greenlands System - Core Areas, Natural Areas and Corridors And Potential Natural Areas and Corridors* also identifies Natural Areas and Corridors (NAC) within the NH Study Area. Additionally, the NH Study Area contains an area of “Highly Vulnerable Aquifer” per *Schedule A-2 Highly Vulnerable Aquifers*.

2.2.4.1 Greenlands System

The Greenlands System is governed by detailed land use policies outlined in Section 2.14 of the Regional Official Plan. These policies include a requirement for proponents of development or site alteration within natural heritage features and areas identified as Greenlands System Core Areas, or on lands adjacent to these features and areas, to conduct an environmental impact study.

Section 2.14.5 defines the Greenlands System as being made up of the following components:

“a) Core Areas, which are designated and shown generally on Schedule C-2, which are protected, restored and enhanced in this Plan and in the local municipal official plans;

b) Natural Areas and Corridors, which will be interpreted, protected, restored, and enhanced and shown, as appropriate, in the local municipal official plans;

c) Potential Natural Areas and Corridors, which will be interpreted, protected,

restored, and enhanced and shown, as appropriate, in the local municipal official plans. Potential Natural Areas and Corridors will be analyzed to determine their functional role in supporting and enhancing the ecological integrity of the Greenlands System;

d) The Natural Heritage System overlay of the Growth Plan and the key natural heritage features and key hydrologic features, which will be protected in accordance with the Plan;

e) The Natural Heritage System overlay of the Greenbelt Plan and the key natural heritage features and key hydrologic features, which will be protected in accordance with the Plan;

f) Urban River Valleys of the Greenbelt Plan, which will be protected and, where appropriate, restored, in accordance with the policies of this Plan;

g) The Natural Core Areas and Natural Linkage Areas land use designations of the Oak Ridges Moraine Conservation Plan and the key natural heritage features and key hydrologic features, which will be protected in accordance with the Plan; and

h) The Escarpment Natural Area and Escarpment Protection Area land use designations of the Niagara Escarpment Plan and the key natural heritage features and key hydrologic features, which will be protected in accordance with the Plan.”

Section 2.14.5 further identifies the Core Areas of the Greenlands System as being made up of the following components:

“a) significant wetlands;

b) significant coastal wetlands;

c) woodlands meeting one or more of the criteria for Core Area woodland in Table 1;

- d) Environmentally Sensitive or Significant Areas;*
- e) Provincial Life Science Areas of Natural and Scientific Interest;*
- f) Escarpment Natural Areas of the Niagara Escarpment Plan; and*
- g) valley and stream corridors meeting one or more of the criteria for Core Area valley and stream corridors in Table 2 and as shown on Schedule C-2.”*

Section 2.14.18 further identifies the Natural Areas and Corridors of the Greenlands System as being made up of the following components:

- “a) evaluated non-provincially significant wetlands and coastal wetlands;*
- b) woodlands meeting one or more of the criteria for NAC woodland in Table 1;*
- c) significant wildlife habitat meeting one or more of the criteria in the Ministry of Northern Development, Mines, Natural Resources and Forestry’s Significant Wildlife Habitat Technical Guide and associated Criteria Schedules for Ecoregions 6E and 7E;*
- d) fish habitat;*
- e) habitat of aquatic species at risk;*
- f) habitat of endangered and threatened species defined in accordance with the Endangered Species Act;*
- g) regionally significant life science Areas of Natural and Scientific Interest;*
- h) provincially significant earth science Areas of Natural and Scientific Interest;*
- i) Escarpment Protection Areas of the Niagara Escarpment Plan;*
- j) the Lake Ontario shoreline and littoral zone and other natural lakes and their*

shorelines;

k) any other valley and stream corridors that have not been defined as part of the Core Areas;

l) sensitive headwater areas and sensitive ground water discharge areas; and

m) any other natural features and functional areas interpreted as part of the Greenlands System Natural Areas and Corridors by the local municipalities, in consultation with the conservation authorities and the Ministry of Northern Development, Mines, Natural Resources and Forestry, including, as appropriate, elements of the Potential Natural Areas and Corridors.”

Section 2.14.19 further identifies the Potential Natural Areas and Corridors of the Greenlands System as being made up of the following components:

“a) unevaluated wetlands and coastal wetlands;

b) cultural woodlands and cultural savannahs within the Urban System meeting one or more of the criteria for PNAC woodland in Table 1. The evaluation of cultural woodlands and cultural savannahs is also subject to Policy 2.14.29;

c) any other woodlands greater than 0.5 hectares;

d) regionally significant earth science Areas of Natural and Scientific Interest;

e) sensitive ground water recharge areas;

f) portions of Historic shorelines;

g) open space portions of the Parkway Belt West Plan Area;

h) enhancement areas, buffers and linkages; and

i) any other natural features and functional areas interpreted as part of the

Greenlands System Potential Natural Areas and Corridors, by the individual local municipalities in consultation with the conservation authorities.”

Schedule A-1: Water Resource System Features & Areas identifies several watercourses within the NH Study Area. According to Section 2.6.6 of the Official Plan, the Region of Peel directs local municipalities to further interpret, refine, identify, or designate “Water Resource System” features and areas within their official plans, as appropriate.

2.2.5 Town of Caledon Official Plan

The Future Caledon Official Plan (2025) was adopted by the Town Council on March 26th, 2024, and approved by the MMAH on October 22, 2025. The Town of Caledon completed a Growth Management & Phasing Plan in 2024 to implement the Future Caledon Official Plan. The Healey Gore - Humber Station West (Northwest) Lands are included in Phase 1 of the Growth Management Plan, prioritizing their development in alignment with the Town’s long-term growth objectives.

The majority of the NH Study Area is delineated as “Urban Area” and “Urban Corridor” in *Schedule B1: Town Structure*. The Urban Area designation includes the undeveloped new urban land that was approved through the Region of Peel Official Plan in 2022 and is expected to accommodate most of the Town's population and employment growth over the next 30 years and beyond. These lands are further classified as “New Urban Area 2051” in *Schedule B2: Growth Management* and “New Community Area” in *Schedule B4: Land Use Designations*.

The southwestern portion of the NH Study Area is also identified as “Natural Features and Areas” with overlapping linework for “Highway 413 Focused Analysis Area” and “NWGTA Transmission Corridor Narrowed Area of Interest” in *Schedule B1: Town Structure*. Furthermore, *Schedule B3a Land Use Designations Greenbelt Plan and Natural Heritage System* identifies “Natural Heritage System” (a component of Greenbelt Protected Countryside) overlapping with the previously described “Natural Features and Areas”. *Schedule D1: Natural Environment System* and *Schedule D2b: New Urban Area Preliminary Natural Environment System* also identify

“Natural Features and Areas” within the Greenbelt Plan Area and “Permanent and Intermittent Streams” within both the Greenbelt Plan Area and the Urban Area portion of the Subject Lands. Additionally, the NH Study Area is also mapped as a “Highly Vulnerable Aquifer” in *Schedule D4a: Highly Vulnerable Aquifers*.

Section 13.9 of the Future Caledon Official Plan outlines the policies for the Natural Environment System in New Community Areas, which were identified through the Peel Region’s 2022 SABE Scoped SWS. The Official Plan requires an LSS, or equivalent study, prepared to the satisfaction of the Town in order to inform the identification and refinement of the Natural Environment System within each Secondary Plan Area and to support new development in the New Community Areas.

2.2.5.1.1 Greenbelt Natural Heritage System

The Future Caledon Official Plan indicates that the Greenbelt NHS is a component of the Town’s Natural Environment System. Section 13.2.2 states that “*the Natural Features and Areas designation and Supporting Features and Areas overlay designation apply through the Town of Caledon and may be more restrictive than provincial plans [...]*”

Section 13.5 of the Future Caledon Official Plan outlines policies for the Greenbelt NHS and KHF’s. Section 13.5.1 identifies activities permitted within KHF’s and KNHF’s (including their VPZ’s) within the Greenbelt NHS, including, but not limited to:

- “a) Forest, fish and wildlife management;*
- b) Conservation and flood and erosion control projects, but only if they have been demonstrated to be necessary in the public interest and after all alternatives have been considered;*
- c) activities that create or maintain infrastructure authorized under an environmental assessment, including a Class Environmental Assessment completed in accordance with the Environmental Assessment Act [...]*”

Section 13.5.2 provides criteria for with development and site alteration within the Greenbelt

NHS, which include the following:

- “a) There are no negative impacts on key natural features or key hydrologic features or their functions, to the satisfaction of the Town;*
- b) Connectivity along the system and between key natural heritage features and key hydrologic features located within 240 m of each other will be maintained or, where possible, enhanced for the movement of native plants and animals across the landscape;*
- c) the removal of other natural features not identified as key natural heritage features and key hydrologic features is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible [...].”*

2.2.5.1.2 Natural Features and Areas

Section 13.3.1 states that the Natural Features and Areas designation corresponds to the Core Areas of the Greenlands System as identified in the Peel Regional Official Plan (2022). The Natural Features and Areas designation includes the following components:

- “a) Provincially Significant Wetlands;*
- b) Woodlands meeting one or more of the criteria for Core Area woodland on Table 1 of the Region of Peel Official Plan;*
- c) Significant valleylands*
- d) Environmentally Sensitive or Significant Areas;*
- e) Provincial Life Science Areas of Natural and Scientific Interest;*
- f) The Escarpment Natural Area designation of the Niagara Escarpment Plan; and*
- g) Valley and stream corridors meeting one or more of the criteria for Core Area valley and stream corridors in Table 2 of the Region of Peel Official Plan.”*

Section 13.3.3 identifies activities that are permitted within the Natural Features and Areas

designation. These include, but are not limited to, “*forest, fish and wildlife management*” and “*conservation and flood and erosion control projects, but only if they have been demonstrated to be necessary in the public interest and after all reasonable alternatives have been considered.*”

Section 13.3.4 indicates that, for activities permitted within the Natural Features and Areas designation:

“Development and site alteration will only be permitted if it has been demonstrated to the satisfaction of the Town, that there will be no negative impacts on the natural feature or their ecological function, and that

- a) There is no reasonable alternative location outside of the Natural Features and Areas designation and use, development or site alteration is directed away from the Natural Features and Areas designation to the greatest extent possible*
- b) If avoidance is not possible, the impact to the feature is minimized;*
- c) Any impact to the feature or its function is mitigated through restoration enhancement to the greatest extent possible; and*
- d) Where ecosystem compensation is determined to be appropriate and feasible, including for essential infrastructure, it may be considered in accordance with Town ecosystem compensation guidelines and applicable Conservation Authority requirements.”*

2.2.5.1.3 Supporting Features and Areas

Section 13.4.1 states that the Supporting Features and Areas overlay designation corresponds to the Natural Areas and Corridors and Potential Natural Areas and Corridors of the Greenlands System as identified in the Peel Regional Official Plan. The Supporting Features and Areas overlay designation includes the following components:

- “a) Evaluated non-provincially significant wetlands;*

- b) *Un-evaluated wetlands;*
- c) *Woodlands meeting one or more of the criteria for a Natural Areas and Corridors woodland in Table 1 of the Region of Peel Official Plan;*
- d) *Cultural woodlands and cultural savannas within the Urban System meeting one or more of the criteria for a Potential Natural Area and Corridor woodland in Table 1 of the Region of Peel Official Plan;*
- e) *Any other woodland greater than 0.5 hectares that does not meet the criteria for a Natural Areas and Corridors woodland in Table 1 of the Region of Peel Official Plan;*
- f) *Significant wildlife habitat meeting one or more of the criteria in the Ministry of Northern Development, Mines, Natural Resources and Forestry significant wildlife habitat technical guide, but located outside of an applicable Provincial plan area;*
- g) *Fish habitat;*
- h) *Habitat of aquatic species at risk;*
- i) *Habitat of endangered species and threatened species;*
- j) *Regionally significant Life Science Areas of Natural and Scientific Interest;*
- k) *Provincially significant Earth Science Areas of Natural and Scientific Interest outside of the Niagara Escarpment Plan Area;*
- l) *The Escarpment Protection Area designation of the Niagara Escarpment Plan;*
- m) *Any other valley and stream corridor that have not been defined as meeting one or more of the criteria for Core Area valley and stream corridors in Table 2 of the Region of Peel Official Plan;*

- n) Sensitive head water areas and sensitive groundwater discharge areas;
- o) Regionally significant Earth Science Areas of Natural and Scientific Interest outside of the Niagara Escarpment Plan Area;
- p) Sensitive groundwater recharge areas;
- q) Enhancement areas;
- r) Linkages; and
- s) Vegetation protection zones identified in Provincial plans and buffers outside of Provincial plan areas.”

Permitted uses within the Supporting Features and Areas overlay designation are those permitted in the Greenbelt NHS (as outlined in **Section 2.2.2**). The Town’s criteria for development and site alteration within the Natural Features and Areas designation outlined in **Section 2.2.5.1.1** also apply to development within the Supporting Features and Areas overlay designation.

2.2.6 Toronto and Region Conservation Authority

The NH Study Area is located within the Humber River watershed which is under the jurisdiction of the TRCA. Effective April 1, 2024, Ontario Regulation (O. Reg.) 41/24: Prohibited Activities, Exemptions and Permits has come into force, replacing the former O.Reg. 166/06: Toronto and Region Conservation Authority: Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation. O. Reg. 41/24 allows Conservation Authorities to implement Section 28 of the *Conservation Authorities Act, 1990* (amended 2024), which states under Section 28(1) that:

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

1. *Activities to straighten, change, divert or interfere in any way with the*

existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.

2. *Development activities in areas that are within the authority's area of jurisdiction and are,*

i. hazardous lands,

ii. wetlands,

iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,

iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or

v. other areas in which development should be prohibited or regulated, as may be determined by the regulations. 2017, c. 23, Sched. 4, s. 25.

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

The TRCA Regulation Mapping (2025) tool identifies several regulated areas within the NH Study Area, including the West Humber River in the southwestern corner and three drainage features on and adjacent to the Subject Lands. To the east of the Subject Lands, the Gore Road tributary of the West Humber River and associated riparian wetlands are also TRCA regulated features.

The TRCA's *The Living City* (2014) guideline outlines the principles, goals, objectives, and policies approved by the TRCA to guide their planning and development approvals process. This document includes policies for determining the Natural System and provides recommendations for buffer widths to protect natural heritage features such as woodlands, wetlands, and valley and stream corridors.

2.2.7 Endangered Species Act, 2007 and Bill 5

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

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

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

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

The *Species Conservation Act, 2025* provides many of the same protections to SAR, with notable changes including the following:

- Revised definition of “habitat”;
- Removal of “harass” from the list of prohibited activities;
- Introduction of an online project registration system; and

- Expansion of eligibility for registration.

2.2.8 Fish and Wildlife Conservation Act, 1997

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

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

2.2.9 Fisheries Act, 1985

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

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process (DFO 2019b). All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the “Request for Review” process. DFO will review the proposed project to

determine whether there is potential to:

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

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

2.2.10 Migratory Birds Convention Act, 1994

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

2.3 Gap Analysis and Data Collection Approach and Methods

The existing natural heritage planning and legislative framework, the SABE Scoped SWS (Wood et al. 2022), and other relevant background reports were reviewed to inform baseline monitoring and ecological field investigations for the LSS. A comprehensive ecological field program was developed to characterize natural heritage features and functions, identify setbacks, refine the Preliminary NHS from the SABE Scoped SWS, and assess natural heritage constraints to development. This program is further detailed below.

GEI used two levels of investigation to obtain detailed information on natural heritage features and functions within the NH Study Area: a background review of existing information sources and detailed field surveys and assessments to gather site-specific ecological data. The following sections describe each level of investigation in further detail.

2.3.1 Background Review

GEI reviewed the following background materials to identify existing natural heritage information and assess potential species presence for the NH Study Area:

- The Physiography of Southern Ontario, 3rd Edition (Chapman & Putnam 1984);
- Aerial imagery (e.g., First Base Solutions, Google);
- MNR Geospatial Ontario: datasets through the Ontario GeoHub platform and the related Make a Map: Natural Heritage Areas (2024) mapping tool;
- MNR Natural Heritage Information Centre (NHIC): database accessed via the Make a Map: Natural Heritage Areas (2024) mapping tool;
- MECP guidance on bat SAR (2022);
- Birds Canada’s Ontario Breeding Bird Atlas (Cadman et al. 2007);
- Ontario Nature’s Ontario Reptile and Amphibian Atlas (2023);
- Toronto Entomologists’ Association’s Ontario Butterfly and Moth Atlases (2025a, 2025b);
- DFO’s “Canadian Aquatic Species at Risk” distribution mapping (2025); and
- Citizen science databases (i.e., iNaturalist [2026] and eBird [2026]).

The results of the background review can be found in **Sections 2.4.1 to 2.4.4**.

2.3.2 Ecological Field Surveys

GEI conducted ecological field surveys between 2022 and 2025 to gather data necessary for assessing the significance of natural heritage features within the NH Study Area, identifying potential ecological constraints to development, and exploring opportunities for restoration and enhancement. Based on GEI's review of aerial imagery and background information, the following ecological field surveys were undertaken to identify and delineate natural heritage features and assess species presence:

- A three-season botanical inventory;
- Ecological Land Classification (ELC);
- Field staking of natural heritage features;
- Stem density assessment;
- Breeding bird surveys (three rounds);
- Bat habitat assessment (one round);
- Amphibian call count surveys (three rounds);
- Snake visual encounter surveys (three rounds);
- Terrestrial crayfish surveys;
- Aquatic Habitat Assessment (AHA, one round);
- Headwater Drainage Feature Assessment (HDFFA, three rounds); and
- Fish community sampling (1 round).

Structure surveys to assess bat use were also originally included in the LSS TOR; however, all

structures were removed from the Subject Lands in 2022, and therefore structure surveys were not required.

The following subsections describe the methods of these ecological field surveys. A summary of the survey types and dates is provided in **Table 1 (Appendix A.1.2)**. The results of the ecological field surveys can be found in **Sections 2.4.5 to 2.4.7**.

2.3.2.1 Vegetation and Landscape Survey Methods

Ecological Land Classification

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

Vegetation communities on the Subject Lands were initially identified using aerial imagery and subsequently ground-truthed and revised as necessary during field visits in 2022 and 2023. For areas outside the Subject Lands, vegetation communities were delineated and characterized through air photo interpretation. Generally, vegetation communities of at least 0.5 ha in size were mapped; however, smaller distinct communities were also mapped where appropriate.

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

Botanical Inventory

GEI conducted a three-season botanical inventory to identify vascular plant species within the NH Study Area in 2022 and 2023, with surveys completed during the spring (May 3, 2023), summer (July 19, 2022) and fall (September 9, 2022). Species nomenclature used in this report generally follows the Database of Vascular Plants of Canada (Brouillet et al., 2010+).

The provincial status of all plant species observed was determined based on NHIC rankings (2024). Local status was assessed based on data for Peel Region, per the *Distribution and Status of the Vascular Plants of the Greater Toronto Area* (Varga et al. 2005).

Natural Heritage Feature Boundary Delineation

Natural heritage features within the Subject Lands were staked with applicable agencies as follows:

- GEI and TRCA staked top of bank limits on December 9, 2024
- GEI and the Town of Caledon staked dripline limits on December 18, 2024
- GEI and TRCA staked wetland limits on July 23, 2025

Staked feature boundaries were surveyed by a licensed Ontario Land Surveyor in all cases.

As will be discussed further in **Section 2.4.5**, portions of the staked dripline were refined following further desktop analysis of select vegetation communities.

Stem Density Assessment

GEI conducted stem density assessments within two vegetation communities on the Subject Lands in June 2025: a Cultural Woodland (CUW1), and a Buckthorn Deciduous Shrub Thicket (THDM2-6).

Within each vegetation community, circular plots were used to determine a representative estimate of stem density as follows:

- Cultural Woodland
 - A single plot (5 m radius) was used, providing 8.1% coverage of the overall ELC polygon.
- Buckthorn Deciduous Shrub Thicket

- Eight 5-m radius plots were used, providing 10.5% coverage of the overall polygon.

As per the Ontario Woodlot Association (2003), a sampling intensity from 2% to 10% is common for the purpose of determining tree stem density. It should be noted that 76% of the THDM2-6 ELC community extended off the Subject Lands and was therefore not accessible; the analysis is therefore based on data from the 24% of the vegetation community that was accessible.

Plot locations were selected through imagery interpretation and knowledge of on-site conditions; the positioning of these plots was designed to capture variability of density and maturity of woody species within the overall community. Within each plot, all live trees of any size were counted and categorized based on diameter at breast height (DBH) (i.e., ≤5 cm, 6-12 cm, 13-20 cm, or >20 cm, following the *Forestry Act* categorization). The collective plot data was used to calculate stem density within the vegetation community. Recognizing that the Town includes most tall shrubs (e.g. Common Buckthorn and Hawthorn) as trees, GEI collected and included that data in the analysis. However, the seedlings of Common Buckthorn were excluded due to their abundance and insignificance with respect to the results of the survey.

2.3.2.2 Wildlife Survey Methods

The following subsections outline the methods used by GEI to conduct targeted wildlife surveys within the NH Study Area.

Breeding Bird Surveys

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

GEI conducted three survey rounds during the peak breeding season, on June 13, June 23, and July 5, 2023, between dawn and five hours after dawn. These survey dates were chosen to ensure suitable weather conditions, without thick fog or precipitation and with wind speeds generally below 19 km/h. Four point-count stations (PC1 to PC4) in different habitat types were surveyed within the Subject Lands (**Figure 3, Appendix A.1.1**) and combined with area searches to help determine the presence, variety, and abundance of bird species. Each point-count station was surveyed for 10 minutes for birds within 100 m and beyond 100 m. All species recorded at a point-count station were mapped to provide spatial information and were observed for signs of breeding behaviour.

Bat Habitat Assessment

Bat habitat assessments are used to determine whether identified features should be considered candidate bat SWH, or if the habitat provides conditions favourable for SAR bats.

The Significant Wildlife Habitat Criteria Schedules (MNR 2015a) consider deciduous and mixed forests and swamps (i.e., ELC communities FOD, FOM, SWD and SWM) that include trees at least 25 cm diameter-at-breast-height (DBH) suitable bat maternity colony habitat. The presence of snags in a suitable ELC community is considered an indicator of high-quality bat maternity roost habitat, and snag surveys are required as the first step in confirming presence of bat maternity colony SWH (as per the PPS).

Snags may also indicate the presence of high-quality SAR bat habitat; however, all SAR bat habitat, regardless of quality, is protected under the ESA, 2007. With respect to SAR bats, coniferous, deciduous or mixed wooded ecosites (including treed swamps), that contain trees at least 10 cm DBH should be considered suitable maternity roost habitat.

Surveys were completed following MNR survey guidelines as outlined in “Bats and Bat Habitats: Guidelines for Wind Power Projects” (MNR 2011), past consultation with MECP, and professional experience. The areas assessed for bat habitat are shown in **Figure 3 (Appendix A.1.1)**. This included two Cultural Woodland features (CUW1) and one Buckthorn Deciduous Shrub Thicket

(THDM2-6).

Within the surveyed area, all trees greater than or equal to 10 cm DBH were visually inspected using binoculars to document any cavities that may or may not be present along the trunk or large branches. Each tree containing suitable cavities or peeling bark (preferred by the Tri-coloured Bat), had the following information recorded: UTM, species, DBH, height class, and snag attributes (i.e., peeling bark, decay class, presence of cavities, etc.).

Amphibian Call Count Surveys

GEI conducted amphibian call count surveys in the NH Study Area following the Marsh Monitoring Program (MMP) methodology (Birds Studies Canada 2014). Five survey stations (AMC1 to AMC5) were selected based on aerial photography and a site reconnaissance (**Figure 3, Appendix A.1.1**).

Nocturnal call count surveys were conducted during the peak breeding season in 2022 and 2023. In 2022, only one call count survey was able to be completed within the round 3 survey window due to the timing to receive authorization to complete ecological works (June 30, 2022). In 2023, the remaining round 1 and round 2 survey windows were targeted (April 12, and May 10, 2023, respectively). Surveys were conducted on warm nights with little wind and no heavy rain. The three survey rounds were conducted when minimum nighttime air temperatures were 5°C, 10°C, and 17°C, respectively, and surveys were conducted at least 15 days apart. Surveys began half an hour before dusk and ended before midnight.

The survey stations were surveyed for three minutes and the MMP call level codes system was used to identify frog activity:

- Level 1 when calls are not simultaneous and calling individuals can be counted;
- Level 2 when some calls are simultaneous but individual calls are distinguishable, and the number of individuals can be estimated; and

- Level 3 when calls are continuous and overlapping in a full chorus.

If loud noise, such as that from plane, train, or road traffic was present, the three-minute monitoring period was delayed until a quieter period. Information recorded included the date and time of each call count survey, species observed, air temperature, wind speed, degree of cloud cover, and level of precipitation.

In addition to targeted call count surveys, any incidental observations of amphibians while out for other survey efforts were also recorded.

Natural heritage comments received from the Town of Caledon (November 2025) noted that SWH ECS (Significant Wildlife Habitat Ecoregion Criteria Schedules) specifies the need for observational surveys in addition to call counts to confirm Amphibian Breeding Habitat type SWH, and that in areas where impacts are proposed, the maximum survey effort is needed to support development proposals with confidence.

GEI acknowledges that visual surveys are also important indicators of amphibian breeding habitat, however, feature context and characterization is also a key factor in the level of effort appropriate to the surveys completed. In the specific case of the Subject Lands, the wetland features on site are limited and the existing conditions do not indicate suitable amphibian breeding conditions based on the limited water depth (less than 5 cm). Regardless, a number of appropriate surveys were completed during peak breeding periods, as summarized in **Table 1 (Appendix A.1.2)** and throughout the report, each of these surveys would have noted all applicable observations (e.g., egg masses or other breeding evidence like tadpoles or adults), however, none were observed during survey efforts. Ultimately, no amphibian breeding evidence was observed during the completion of other surveys within the amphibian breeding timing window, consistent with the limited breeding evidence recorded during amphibian breeding surveys. Therefore, no additional survey effort is proposed to be completed.

Snake Visual Encounter Surveys

GEI performed three rounds of snake Visual Encounter Surveys (VES; April 11, 20, and 27, 2023)

during the spring emergence period (late-April to mid-May), when the probability of detecting snakes is highest. Snake visual encounter surveys were conducted on mild spring mornings (minimum 8°C, and no greater than 25°C) with sunny or overcast conditions, between the hours of 8:00 and 14:00.

Incidental surveys included lifting debris on site to check for snake presence and general visual sweeps for snakes while traversing the site. Information recorded during these surveys included the date and time of each visual encounter calling survey, species observed, locations of observations (UTM coordinates), air temperature, and weather conditions.

Natural heritage comments received from the Town of Caledon (November 2025) noted “the snake surveys should be planned and designated “dedicated”, not incidental. Where present, they are also of major ecological importance. Visual Encounter Surveys may suffice in many areas, but where congregation sites, thermoregulation sites, hibernation sites, shedding sites or nesting sites are suspected or in evidence, further efforts are warranted, potentially including Artificial Cover Object surveys or other studies”.

Snake surveys completed within the Subject Lands were targeted efforts, and were not completed incidentally, see specific survey dates from **Table 1 (Appendix A.1.2)**; April 11, 20 and 27, 2023. GEI does acknowledge that snake species are cryptic and can be difficult to accurately survey for, however, active agricultural fields are not suitable for snake hibernacula, nor are wetlands though they may provide other life cycle habitats. Thus, the only two areas that could potentially support features with access below the frostline; the previously existing residence and the protected valleyland, are where the targeted snake visual encounter surveys were conducted.

Within the MNR 'Survey Protocol for SAR Snakes (2016) " several survey methods are discussed. However, visual encounter surveys (VES) are the only survey method that is recommended for assessing presence/absence for all species except the Butler's Gartersnake; both VES and Artificial Cover Object (ACO) surveys are recommended for assessing presence/absence of the Butler's Gartersnake." This portion of the protocol outlines the VES methods are appropriate for all snakes, with other methods like ACO and road mortality survey efforts improves the chances of detection.

However, as it is a large effort (2 weeks of the ACOs being out to create suitable conditions), this method typically used when potential habitat has been identified/or indicated by other observations. Additionally, the protocol states "ACO surveys can be a very effective method of detecting cryptic, difficult-to-survey-for snake species, especially in environments where natural cover is limited or cannot be easily searched...Thus, ACO surveys are best suited for long-term monitoring or augmenting VES surveys at sites where natural cover is limited..." which does not apply to the features observed within the Subject Lands, although habitat may be supported within the West Humber River valley.

As outlined in Section 2.4.6.4, no snakes were observed despite suitable spring emergence survey efforts around the two features with any potential to provide access below the frostline, indicating the absence of "congregation sites, thermoregulation sites, hibernation sites, shedding sites or nesting sites" as outlined in the comment received.

Comments also requested the inclusion of in- or near-water structure for aquatic or semi-aquatic species, as snake hibernacula are generally not visible or obvious.

Active agricultural fields are not suitable for snake hibernacula, nor are wetlands though they may provide other life cycle habitats. Limited amphibian breeding habitat was also identified within the Subject Lands (though two species were recorded off site), indicating limited foraging habitat. Additionally, no animal burrows or similar features along the WHT1(6)3-1 and WHT1(6)4-1 drainage features nor the MAM2 associated with the West Humber River were observed that indicate any access below the frostline with limited to no existing cover objects present. Thus, the only two areas that could potentially support features with access below the frostline include; the previously existing residence and the protected valleyland, where the targeted snake visual encounter surveys were conducted during the suitable spring emergence period.

No additional surveys are considered warranted, based on the lack of any snake observations during either targeted VES surveys or incidentally during the other surveys completed.

Terrestrial Crayfish Survey

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

Within the NH Study Area within the Subject Lands, incidental Terrestrial Crayfish surveys were conducted incidentally in conjunction all visits within the applicable April – August window (see **Table 1, Appendix A.1.2** for survey dates). Due to the difficulty of visually observing crayfish individuals, their presence was confirmed by identifying burrows, also referred to as chimneys. If identified, the locations of clusters, which signified a colony, and individual chimneys were recorded using a hand-held GPS device. Additional information, such as the surrounding vegetation within a 1 m radius, distance to water, and the number of chimneys observed, was also documented.

Turtle Surveys

Natural heritage comments received from the Town of Caledon (November 2025) requested “to include turtle surveys, for suitable habitat features, but also for turtles on the move as they frequently use small HDFs and other natural corridors as well as adjacent areas for nest exploration as well as dispersal in early and late season”.

GEI acknowledges that turtle movement corridors are important to consider, particularly in close proximity to the West Humber River valley. However, the two areas providing the largest connection to key habitats will be maintained, protected and enhanced as appropriate (West Humber River and WHT1(6)4-1). Therefore, turtle surveys were not deemed to be necessary.

2.3.2.3 Aquatic Survey Methods

The following subsections outline the methods used by GEI to conduct aquatic surveys within the NH Study Area. Aquatic surveys included an AHA of the watercourse within the Subject Lands,

HDFAs for other drainage features within the NH Study Area, and electrofishing of select features (see **Figure 3, Appendix A.1.1**).

Aquatic Habitat Assessment

An AHA was conducted on August 17, 2022, within the West Humber River where it flows through the southwestern portion of the Subject Lands. The AHA consisted of a visual survey of instream and riparian habitat conditions along and adjacent to the watercourse. The following features were documented during the survey:

- Hydrology (e.g., flowing or standing water);
- General watercourse morphology (e.g., riffle, run, pool);
- Wetted width and depth (at time of survey);
- Bed and bank substrate;
- Instream habitat (e.g., woody debris, aquatic vegetation, undercut banks);
- Presence of obstructions to fish movement (e.g., culverts, debris dams);
- Evidence of groundwater inputs (e.g., springs, seeps, iron flocculation/staining); and
- Riparian habitat.

Headwater Drainage Feature Assessment

GEI assessed potential HDFs within the NH Study Area using the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (CVC and TRCA 2014; hereafter referred to as the “HDFa Guidelines”). The HDFa Guidelines provide a standardized approach to identifying and evaluating HDFs, assessing their ecological and biophysical functions, and providing long-term management recommendations to protect or maintain the important ecological or biophysical functions in a developing landscape. Surveys were completed in 2022,

2023 and 2024 as outlined chronologically in the following paragraphs.

The first site visit to assess HDFs was completed in August 2022 during the round 3 (summer) HDFA window. GEI was unable to complete the typical earlier round 1 and 2 (early and late spring) surveys due to the timing of project initiation. Prior to conducting the first HDFA visit in August 2022, GEI completed a desktop review to identify the locations of potential HDFs. This process involved an ArcGIS mapping exercise using available 2014 LiDAR data to determine potential flow paths on the landscape based on topographic relief. The resulting map provided a screening tool for use during the HDFA surveys. All portions of the NH Study Area within the Subject Lands were assessed during the first HDFA visit in August as well as subsequent surveys in 2023, even if the screening did not identify a feature as potentially present.

In 2023, GEI conducted three additional survey rounds (April 12, May 25 and August 29) to assess HDFs within the NH Study Area to ensure that a full dataset was collected within the same year.

An additional 3 rounds of HDFA were completed on April 10, May 31, and August 14, 2024, to provide multi-year data on HDFs on the Subject Lands. Features identified during the pre-screening effort (as documented above) that were found to be absent or dry upon the round 1 investigations in April 2024 were not mapped.

During the first round HDFA in April 2024, the NH Study Area was thoroughly walked to identify potential HDFs (i.e., not just those identified during the 2022/2023 surveys). Each observed HDF was divided into specific reach breaks following the reach delineation guidance in the HDFA Guidelines. Data collection for each reach was conducted in accordance with the *Ontario Stream Assessment Protocols for Unconstrained Headwater Sampling, Section 4: Module 11* (OSAP; Stanfield, ed. 2017), and a photographic record of each feature was taken during each survey event. Where property access was not available for HDFs upstream or downstream from the Subject Lands, observations were made from the property boundary.

Drainage feature WHT1(6)3-1 was assessed using the HDFA Guideline sampling protocol, although it is acknowledged that through on-site discussions with TRCA in 2025, WHT1(6)4-1 is

being treated as a regulated watercourse for the purposes of this assessment.

Upon completing the surveys, the collected data was analyzed to classify the HDFs and determine appropriate management recommendations based on the hierarchical framework outlined in the HDFA Guidelines.

Fish Community Sampling

A license to collect fish was obtained from the Ministry of Natural Resources and Forestry to electrofish the drainage features that were not connected to occupied Redside Dace habitat that occurs in the West Humber River. This included WHT1(6)3-1 and WHT1(6)4-1 (**Figure 3, Appendix A.1.1**).

2.4 Biophysical Characterization

This section provides an overview of the physical and ecological characteristics of the NH Study Area. It describes the physiographic context, regional landscape ecology, and natural heritage features, including vegetation communities, wildlife, and aquatic habitats. Background reviews and results of ecological surveys are presented to identify and assess species' presence, habitat conditions, and ecological functions within the NH Study Area.

2.4.1 Physiography

The Subject Lands are located in the South Slope physiographic region, which forms the southern slope of the Oak Ridges Moraine and extends from the Niagara Escarpment to the Trent River. This sloping plain covers approximately 2,432 km² and rises to the line of contact with the moraine at elevations of 240 to 305 m above sea level. This represents an increase of up to 120 m over a distance of approximately 11 km. The region is underlain by limestones, grey shales, and reddish shales, which influence its soil composition and hydrology.

Soils on the South Slope are diverse and have supported agriculture for over a century. Key soil series include the sandy Dundonald series in the east and the clay loams of the Chinguacousy and

Oneida series in the west. The landscape is characterized by drumlinized terrain, fluted till plains, and steep valleys carved by fast-flowing streams. Intermittent drainage patterns have contributed to gully erosion, particularly in areas with steep slopes, where agricultural lands face challenges from soil loss.

Prominent natural features in this physiographic region include the steep valleys of tributaries to the Rouge, Don, and Humber river systems, which contribute to the region's ecological and hydrological functions. Historically, the South Slope was dominated by oak, hickory, and white pine forests, much of which has been converted to agriculture and urban development (Chapman & Putnam, 1984).

2.4.2 Landscape Ecology

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

Consideration of the larger ecological matrix or landscape provides insight into potential interactions between abiotic and biotic flows. The primary ecological linkage in the local landscape is formed by the woodland, thicket, meadow, and wetland communities associated with The West Humber River valleyland within the Greenbelt Plan Area in the southwest corner of the site. These areas offer the greatest opportunity for the movement of organisms, matter, and energy across the surrounding landscape. The watercourse and HDFs in the northern portion of the NH Study Area also contribute to some limited wildlife movement opportunities, although these features are ephemerally flowing and generally lack substantial natural riparian cover. The agricultural lands that dominate the Subject Lands and surrounding areas to the north and east offer

more limited opportunities for wildlife movement due to agricultural land management practices. Movement opportunities to the north and west are further constrained by major roads and urban development.

2.4.3 Natural Heritage Areas Mapping

The MNR Geospatial Ontario's *Make a Map: Natural Heritage Areas* (2024) mapping tool identifies the following natural heritage features within the NH Study Area (**Figure 2, Appendix A.1.1**):

- The Greenbelt and associated West Humber River bisect the southwest corner of the NH Study Area; and
- The Gore Road Tributary and associated unevaluated wetlands are east of the site.

No additional natural heritage features were identified within the NH Study Area through this mapping tool. Information from the NHIC database, while accessed via *Make a Map: Natural Heritage Areas*, is presented separately in **Section 2.4.4.1**.

Although the *Make a Map: Natural Heritage Areas* mapping tool did not identify any ANSIs on or within 120 m of the Subject Lands, the Geospatial Ontario database that GEI used to obtain relevant MNR natural heritage mapping identified the Candidate Goose Moraine Earth Science ANSI within 120 m of the Subject Lands (in the northwest quadrant of the Healey Road/Gore Road intersection) as shown on **Figure 2 (Appendix A.1.1)**.

2.4.4 Wildlife Background Review

The following subsections present the results of the wildlife background information review for the NH Study Area.

2.4.4.1 Natural Heritage Information Centre

The MNR NHIC database was accessed via the *Make a Map: Natural Heritage Areas* (2024)

mapping tool, and searched for records of provincially significant plants, vegetation communities, and wildlife within the Subject Lands and the surrounding areas. The database provides occurrence data in 1 km x 1 km (1 km²) area squares, with two squares overlapping the Subject Lands (17PJ0055 and 17PJ0054). All species identified within the NHIC squares may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors in species' presence and use.

A total of six species of interest were recorded in the squares that overlap with the Subject Lands:

- Species listed as Threatened or Endangered on the SARO list:
- Redside Dace (*Clinostomus elongatus*) – Endangered;
- Bobolink (*Dolichonyx oryzivorus*) – Threatened; and
- Eastern Meadowlark (*Sturnella magna*) – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1–S3 species):
- Eastern Wood-pewee (*Contopus virens*) – Special Concern;
- Wood Thrush (*Hylocichla mustelina*) – Special Concern;
- American Brook Lamprey (*Lethenteron appendix*) – S3

Both squares overlapping the NH Study Area also contained listing of a Mixed Wader Nesting Colony wildlife concentration area.

2.4.4.2 Bat Species at Risk

Seven out of Ontario's eight bat species are listed on the SARO list as Endangered:

- Eastern Red Bat (*Lasiurus borealis*);

- Eastern Small-footed Myotis (*Myotis leibii*);
- Hoary Bat (*Lasiurus cinereus*);
- Little Brown Myotis (*Myotis lucifugus*);
- Northern Myotis (*Myotis septentrionalis*);
- Silver-haired Bat (*Lasionycteris noctivagans*); and
- Tri-colored Bat (*Perimyotis subflavus*).

These SAR bat species are known to form maternity roosts within wooded areas, individual trees, and anthropogenic structures such as barns, houses, garages, and sheds. The MECP generally considers SAR bats to be ubiquitous within forest and swamp communities, and therefore these species are potentially present within the NH Study Area.

2.4.4.3 Ontario Breeding Bird Atlas

The *Ontario Breeding Bird Atlas (OBBA) Data Summary: 2001–2005* (Cadman et al. 2007) contains detailed information on the population and distribution status of birds in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17TPJ05). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed bird species from this atlas square are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to bird species' presence and use.

A total of 99 species were recorded in the atlas square that overlaps with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO list:
- Acadian Flycatcher (*Empidonax virescens*) – Endangered;

- Bank Swallow (*Riparia riparia*) – Threatened;
- Bobolink – Threatened;
- Eastern Meadowlark – Threatened; and
- Chimney Swift (*Chaetura pelagica*) - Threatened
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1–S3 species; B=breeding population, N=non-breeding population, M=migrant population):
- Barn Swallow (*Hirundo rustica*) – Special Concern;
- Common Nighthawk (*Chordeiles minor*) – Special Concern;
- Eastern Wood-pewee – Special Concern;
- Wood Thrush – Special Concern; and
- Upland Sandpiper (*Bartramia longicauda*) – S3B.

2.4.4.4 Ontario Reptile and Amphibian Atlas

The *Ontario Reptile and Amphibian Atlas* (Ontario Nature 2023) contains detailed information on the population and distribution status of herpetofauna in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17PJ05). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed herpetofauna species are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to herpetofauna species presence and use.

A total of 17 species were recorded in the atlas square that overlaps with the Subject Lands, of which eight are frog and toad species, three are salamander species, two are turtle species, and four are snake species. The following species of interest was noted:

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

2.4.4.5 Ontario Butterfly and Moth Atlas Results

The *Ontario Butterfly and Moth Atlases* (Toronto Entomologists’ Association 2025a, 2025b) contain detailed information on the population and distribution status of butterflies and moths in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17PJ05). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed butterfly and moth species are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to butterfly and moth species presence and use.

A total of 74 species were recorded in the atlas square that overlaps with the Subject Lands, of which 62 are butterfly species and 12 are moth species. The following species of interest was noted:

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

2.4.4.6 Aquatic Species at Risk Distribution Mapping

The DFO *Canadian Aquatic Species at Risk* (2025) distribution mapping tool was used to identify any known occurrences of aquatic SAR, including fish and mussels, within the watercourses and HDFs on the Subject Lands, as well as upstream and downstream reaches.

Redside Dace habitat was identified within the West Humber River located in the southwest corner of the Subject Lands. None of the other surface water drainage features in the NH Study Area were identified in the DFO mapping tool as providing habitat for aquatic SAR.

2.4.4.7 Citizen Science Databases (iNaturalist and eBird)

The iNaturalist (2026) database is a large citizen science-based project that aims to collect, archive, and share sightings of flora and fauna species. Users can submit observations to be reviewed and identified by naturalists and scientists to help provide accurate species observations. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence. It should be noted that only “research grade” observations will be referenced.

This online database was examined to identify observations made within the NH Study Area that were research grade. No species of conservation concern or Endangered/Threatened species were identified.

The eBird (2026) database is a large citizen science-based project that aims to gather bird diversity information in the form of checklists of birds, archive it, and share it to power new data-driven approaches to science, conservation, and education. As observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.

The nearest “hotspot” (as identified by eBird), is Brampton-Colonel Pond. This hotspot is located well outside of the Subject Lands and the adjacent 120 m and therefore, results from this hotspot would not apply to the NH Study Area.

2.4.5 Vegetation and Landscape Survey Results

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

2.4.5.1 Vegetation Communities

ELC mapping of the NH Study Area is shown in **Figure 4 (Appendix A.1.1)**. A description of each ELC community within the Subject Lands is provided in **Table 2 (Appendix A.1.2)**.

The Subject Lands primarily consists of fallow agricultural fields. A former residential/disturbed (RES/DIST) area, consisting of the driveway and disturbed land associated with the former rural residence and agricultural buildings is also centrally located within the Subject Lands. Three drainage features also traverse the fallow field portion of the Subject Lands (WHT1(6)3-1, WHT1(6)4-1, and WHT2(2)1-1a, see **Section 2.4.7.2** for more details on these features).

In addition to the drainage features within the northern portion of the site, the southwestern portion of the Subject Lands is located within the Greenbelt Plan Area and contains a portion of the West Humber River valleyland. Within this southwestern corner, the Subject Lands contain a small Mineral Cultural Woodland (CUW1) near The Gore Road, a treed area comprised of a Buckthorn Deciduous Shrub Thicket (THDM2-6) and a small portion of CUW1, two Dry-Moist Old Field Meadows (CUM1-1), and a narrow section of Mineral Meadow Marsh (MAM2) directly along the West Humber River channel.

To the north of the Subject Lands, Healey Road extends along the entire Subject Lands boundary. Beyond Healey Road the adjacent lands (within 120 m of the Subject Lands) contain row crops (AG) and residential (RES) areas.

Agricultural (AG) fields are also present east of the Subject Lands; however, a portion of the Gore Road Tributary, and an associated area of Reed-canary Grass Mineral Meadow Marsh (MAM2-2), is also present to the east (within 120 m of the Subject Lands).

Agricultural (AG) fields continue south of the Subject Lands; however, the Greenbelt Plan Area south of the site also contains more naturalized communities associated with the West Humber River, including a Mineral Cultural Woodland (CUW1) and several areas of Dry-Moist Old Field Meadow (CUM1-1), a large portion of Buckthorn Deciduous Shrub Thicket (THDM2-6), and a narrow section of Mineral Meadow Marsh directly along the river channel (MAM2). Many of these more naturalized communities are partially present on to the Subject Lands and extend south offsite.

To the west of the Subject Lands the Gore Road is present. Beyond Gore Road, ecological surveys

west of the site also noted a mixture of residential and anthropogenically influenced areas (residential areas, mowed lawns, CUM1-1, agricultural lands) alongside several treed communities. Treed communities west of the Subject Lands (within 120 m) included one area of Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1), one area of Swamp Maple Mineral Deciduous Forest (SWD3-3), and two areas of Deciduous Forest (FOD).

No provincially rare vegetation communities were identified on or within 120 m of the Subject Lands, based on rarity designations from the NHIC (2021).

2.4.5.2 Vascular Plants

GEI identified 114 vascular plant species (inclusive of subspecies, varieties, and hybrids) within the NH Study Area during the three-season botanical inventory. Of these, 50 species (44%) are native, while 64 species (56%) are exotic. The relatively high abundance of exotic species can be attributed to the maintained condition of the anthropogenic areas, and the prominence of cultural vegetation types in the naturalized areas. Among the native species, 94% are ranked S5 (secure in Ontario), and 4% are ranked S4 (apparently secure in Ontario). A complete list of vascular plant species is provided in **Table 3 (Appendix A.1.2)**.

2.4.5.3 Plant Species of Conservation Interest

No vascular plant species identified within the NH Study Area during the botanical inventories were classified as SAR or provincially rare (S1–S3). However, one locally rare species was observed based on Peel Region rarity rankings (Varga et al. 2005):

- White Spruce (*Picea glauca*) – R3; and

White Spruce was observed infrequently on the former residential property. It is considered likely that this species was planted on site rather than occurring naturally. These trees were removed from the Subject Lands in 2022. This species was not observed in the more naturalized portions of the Subject Lands.

2.4.5.4 Potentially Sensitive Plant Species

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

2.4.5.5 Invasive Plant Species

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

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

Of the 64 exotic plant species identified on the Subject Lands, nine are classified as Category 1 by Urban Forest Associates:

- European Buckthorn (*Rhamnus cathartica*)
 - Rare in cultural meadows
 - Abundant in the Buckthorn Deciduous Shrub Thicket
 - Occasional to abundant in cultural woodlands
- Canada Thistle (*Cirsium arvense*)

- Occasional in cultural meadows
- Dame's Rocket (*Hesperis matronalis*)
 - Rare in cultural meadows
- Purple Crown Vetch (*Securigera varia*)
 - Rare in cultural meadows
- Purple Loosestrife (*Lythrum salicaria*)
 - Rare in the open aquatic / shallow marsh watercourse (West Humber River)
- Curly-Leaved Pondweed (*Potamogeton crispus*)
 - Occasional in the open aquatic / shallow marsh watercourse (West Humber River)
- Garlic Mustard (*Alliaria petioloata*)
 - Occasional in cultural woodlands
- Showy Fly Honeysuckle (*Lonicera x bella*)
 - Rare in the Buckthorn Deciduous Shrub Thicket
 - Occasional in cultural woodlands
- Manitoba Maple (*Acer negundo*)
 - Occasional to abundant in cultural woodlands

2.4.5.6 Wetlands

The MNR GeoHub database was accessed to determine if any MNRF-mapped wetlands have been mapped on or in the vicinity of the Subject Lands. Such wetlands could include Provincially Significant Wetlands, MNRF evaluated wetlands, or unevaluated wetlands. Results show that no MNRF-mapped wetlands have been identified on the Subject Lands, though unevaluated wetlands are mapped on adjacent lands, such as the Reed-canary Grass Mineral Meadow Marsh (MAM2-2) associated with the Gore Road Tributary to the East of the Subject Lands.

While no wetlands were identified within the Subject Lands by MNR GeoHub mapping, surveys completed by GEI identified several previously unmapped wetlands within the Subject Lands and the surrounding 120 m.

Within the Subject Lands, the largest wetland observed was a complex of open water (OA) and shallow marsh (MAS2) / meadow marsh (MAM2) associated with the West Humber River in the Greenbelt Plan Area. Water was present in this feature during each survey and this feature extends offsite along the river corridor. This wetland was confirmed by GEI staff using the ‘50/50 rule’, where features having over 50% cover of wetland plants were classified as wetland. The boundaries of four very small areas of wetland vegetation (including pockets with sizes of 12 m², 21 m², 74 m² and 247 m²) were also staked within the Subject Lands on July 23, 2025 with TRCA. These features are small, and are all associated with drainage features WHT1(6)3-1 and WHT1(6)4-1 on the Subject Lands (see **Figure 6, Appendix A.1.1**). These features were too small to map as separate ELC polygons.

Within 120 m of the Subject Lands GEI’s surveys noted a small area of Swamp Maple Mineral Deciduous Swamp (SWD3-3) across The Gore Road, a small area of Cattail Mineral Shallow Marsh (MAS2-1) across The Gore Road; and an area of Reed-canary Grass Mineral Meadow Marsh (MAM2-2) immediately east of the Subject Lands (see **Figure 6, Appendix A.1.1**).

Where there are differences between GEI’s ELC mapping and existing wetland mapping (i.e., MNR GeoHub mapping), GEI’s mapping is considered more accurate as it reflects current site conditions based on detailed field surveys and feature staking with the TRCA and the Town of Caledon.

2.4.5.7 Natural Feature Boundary Delineation

Wetland Boundary Delineation

The results of the wetland staking conducted with TRCA within the NH Study Area on July 23, 2025, are presented in **Figure 3 (Appendix A.1.1)**. The staked boundary of the MAM2-2 at the downstream end of HDF WHT1(6)3-1 only slightly encroaches onto the Subject Lands, with the majority of the wetland being located on the adjacent property. The staked boundary on the Subject Lands was used to refine ELC mapping and determine the limits of the NHS.

The four staked areas of wetland vegetation along drainage features WHT1(6)3-1 and WHT1(6)4-1 were too small to map in ELC. As will be discussed in Phase 2 of this report, these wetlands are proposed to be altered for HDF removal and watercourse realignment.

Woodland Boundary Delineation

The results of the woodland dripline staking conducted with the Town of Caledon within the NH Study Area on December 18, 2024, are presented in **Figure 3 (Appendix A.1.1)**.

However, the staked dripline was further analyzed by GEI following the staking event. It was determined that a portion of the staked dripline did not meet the criteria to be part of the woodland. Specifically, the dripline staked by the Town included a narrow linear projection of the Buckthorn Thicket (THDM2-6). Further analysis following staking confirmed that the area was 41 m long with an average width ~12 m. Given that the area is 3x longer than its average width, it has been excluded as part of the woodland and staking along this area is not included on further figures in this report.

The remainder of the staked woodland boundary was used to refine ELC mapping for the Subject Lands and determine the limits of the NHS.

Top of Bank Delineation

The results of the top of bank staking conducted with TRCA within the NH Study Area on December 9, 2024, are presented in **Figure 3 (Appendix A.1.1)**. Two top of bank areas were staked with TRCA including 1) the top of bank associated with the West Humber River, 2) and an area associated with HDF WHT2(2)1-1a that projects into the Subject Lands as a depressional draw from the West Humber River valleyland to the south. The West Humber River valleyland has been used to determine the limits of the NHS (including KNHFs within the Greenbelt Plan area). However, the top of bank staked with TRCA along HDF WHT2(2)1-1a has not been used to determine any NHS components and is not included on further figures in this report, given that it should not be considered to be a valleyland based on the following rationale:

- The area of the valley staked by TRCA on the Subject Lands consists of historically agricultural lands within a defined, though relatively low slope, depressional area.
- A No Management Required HDF has been identified within the depressional area.
- There is no regulatory floodplain associated with the portion of the staked feature on the Subject Lands based on TRCA Regulation mapping;
- Based on historical aerial imagery, the agricultural portion on the Subject Lands appears to have been historically farmed through (pre-2014), although a narrow meadow corridor has formed along the HDF since that time.
- The area staked by TRCA as top of bank is a depressional area that follows this drainage feature draw up from the adjacent West Humber River valleyland, where it is relatively low gradient and historically farmed through.
- This area of the Subject Lands should not be identified as a valleyland, given its nature as a lower gradient, relatively narrow draw through agricultural lands separate from the larger and better defined West Humber River.
- The geotechnical assessment has confirmed that the proposed development is not expected to have a negative impact on stability of the adjacent West Humber River valley slopes.

This area will be reviewed in spring 2026 during a site visit with TRCA to reach an agreement on the designation and management of the area.

2.4.5.8 Stem Density Results

As previously outlined in **Section 2.3.2.1**, stem density assessments were completed within two vegetation communities in the southwest portion of the Subject Lands: a Cultural Woodland (CUW1), and an adjacent Buckthorn Deciduous Shrub Thicket (THDM2-6). These surveys were intended to determine if these communities meet the definition of woodland included in the

Caledon Official Plan (2025).

The results of the stem density assessment are presented below:

Mineral Cultural Woodland (CUW1)

Table 2-1 Stem Density Assessment – CUW1

Overall Stem Density		
Trees/ha	Criteria met?	Woodland Criteria
2037	Yes	(a) 1,000 trees, of any size, per hectare,
1273	Yes	(b) 750 trees, measuring over five centimetres in diameter, per hectare,
1019	Yes	(c) 500 trees, measuring over 12 centimetres in diameter, per hectare, or
764	Yes	(d) 250 trees, measuring over 20 centimetres in diameter, per hectare,

Based on the results presented in **Table 2-1**, the CUW1 adjacent to the THDM2-6 feature meets both the Town’s definition of woodland and the ELC definition of woodland. Given that all trees documented in the surveyed plot were native, targeted native stem density surveys were not required and, this feature does not meet the Town’s exclusionary clause given it has greater than 100 stems of native trees per hectare.

Buckthorn Deciduous Shrub Thicket (THDM2-6)

Table 2-2 Stem Density Assessment – THDM2-6

Overall Stem Density		
Trees/ha	Criteria met?	Woodland Criteria
4759	Yes	(a) 1,000 trees, of any size, per hectare,
875	Yes	(b) 750 trees, measuring over five centimetres in diameter, per hectare,
366	No	(c) 500 trees, measuring over 12 centimetres in diameter, per hectare, or
16	No	(d) 250 trees, measuring over 20 centimetres in diameter, per hectare,

Table 2-3 Native Stem Density Assessment – THDM2-6

Native Stem Density		
Native Trees/ha	Criteria met?	Exclusion Criteria (Section 13.12.4 of the Caledon Official Plan)
3883	Yes	(a) 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

Based on the results presented in **Table 2-2** and **2-3**, the THDM2-6 meets the Town’s definition of woodland, given that the Town considered Buckthorn to be a tree species. Further, it does not meet the Town’s exclusionary clause given it has greater than 100 stems of native trees per hectare. Although this feature satisfies the Town’s definition of woodland, it does not satisfy the ELC definition of woodland, since it has less than 25% tree canopy cover; therefore, while the results of this survey do not alter ELC categorization of this feature (i.e., it continues to be shown in ELC as a Buckthorn Deciduous Shrub Thicket), for planning purposes, it is treated as a woodland.

In addition to the CUW1 and THDM2-6 evaluated above, a western CUW1 feature is also present within the Subject Lands (in the Greenbelt Plan area adjacent to The Gore Road). This feature is 0.32 ha in size and therefore does not meet the 0.5 ha minimum area requirement to be considered a woodland per the Town of Caledon Official Plan (2025). Given this feature does not meet Caledon’s minimum woodland area requirement, it was not assessed further for stem density and is not considered a woodland.

2.4.6 Wildlife Survey Results

The following subsections present the results of the targeted wildlife surveys conducted by GEI within the NH Study Area.

2.4.6.1 Birds

A total of 37 bird species were observed within the NH Study Area. Of these, 3 species were

confirmed breeders, 17 were probable breeders, and 13 were possible breeders within the Subject Lands. The remaining four species were classified as non-breeders, flyovers, or migrants. Additionally, one species was observed only on adjacent lands (within 120 m of the Subject Lands).

A total of 36 (97%) of the confirmed, probable, or possible breeders are provincially ranked as S5 (common and secure), S4 (apparently common and secure), or SNA (species not native to Ontario). The following species of interest were noted:

- Species listed as Threatened or Endangered on the SARO list:
 - **Bobolink (*Dolichonyx oryzivorus*) – Threatened in Ontario**
 - During round 1, two Bobolinks were observed at point count 1 (located in the West Humber River valleyland in the southwest corner of the Subject Lands), but neither was heard vocalizing. No observations of Bobolink were recorded at point count 1 in later survey rounds. The grassland habitat in this location was considered marginally suitable as it was small in area, with widely distributed trees and shrubs. During round 2, a single Bobolink was heard singing at point count 2 (in the fallow former agricultural area in the southeast corner of the Subject Lands). The habitat here was also considered marginal due to its small size and low quality of grass and forb structure that the species prefers. A third grassland bird survey was conducted in July of 2023 as per the MNR Bobolink Survey Methodology (2012). No Bobolink were heard or observed on site during round 3.
 - **Eastern Meadowlark (*Sturnella magna*) – Threatened in Ontario**
 - No suitable Eastern Meadowlark breeding habitat was observed on the Subject Lands; however, several calling Eastern Meadowlark individuals were observed adjacent to the Subject Lands in a large hayfield west of The Gore Road.

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1–S3 species):
 - **Eastern Wood Pewee (*Contopus virens*) – Special Concern in Ontario**
 - A single male was heard singing from riparian vegetation offsite along the West Humber River during round 3. Given that this observation was only recorded during round 3 and the surrounding vegetation largely consists of a Common Buckthorn thicket, this was not considered suitable breeding habitat.
 - **Barn Swallow (*Hirundo rustica*) – Special Concern in Ontario**
 - Up to seven individuals of this species were observed at once across the three rounds of surveying; however, no suitable breeding structures for this species are present within the Subject Lands. Therefore, no breeding evidence was observed during the surveying period within the Subject Lands.
 - **Upland Sandpiper (*Bartramia longicauda*) – S2B**
 - Upland Sandpiper was observed on both the Subject Lands and an adjacent property during breeding bird surveys. One singing male was detected in the hayfields west of The Gore Road during round 1. During round 2, a pair of Upland Sandpipers was observed west of point count 4 within an area of row crop, and a single male was heard to the east of point count 4 (within the agricultural lands on the adjacent property). The species is known to require large tracts of uncut hay (at least 60 ha) for breeding (Mong 2005). Tracts of this size do not occur on the Subject Lands; therefore, it is presumed that the birds recorded during round 2 had dispersed onto the Subject Lands, perhaps post-breeding or due to breeding failure on the west side of The Gore Rd.

A complete list of observed bird species is provided in **Table 4 (Appendix A.1.2)**.

2.4.6.2 Bat Habitat Assessment

As previously mentioned, a bat habitat assessment was completed within the southwestern corner of the NH Study Area. Two potentially suitable snags were observed within the western CUW1 community, and seven potentially suitable snags were observed within the CUW1/THDM2-6 community (**Figure 9, Appendix A.1.1**).

2.4.6.3 Amphibians

Much of the NH Study Area consists of active or former agricultural fields (now fallow), with several wetland features regularly influenced by agricultural land management practices. Despite this, these areas were surveyed for calling amphibians, although they often consisted of pooled water with limited emergent vegetation.

No amphibian species were heard calling within the Subject Lands during the three rounds of call count surveys; however, American Toad (*Anaxyrus americanus*) was heard calling within 120 m of the Subject Lands from AMC station 3 (located at the edge of the off-site wetland along the Gore Road Tributary in the southeast corner of the Subject Lands), and Western Chorus Frog (*Pseudacris triseriata*) was heard calling from outside of the NH Study Area (i.e., greater than 120 m from the Subject Lands) from AMC station 5 (at the north end of the Subject Lands). The American Toad observation is assumed to originate from the MAM2-2 community to the east of the Subject Lands while the Western Chorus Frog observation is assumed to originate from a pond on the 13059 The Gore Road property north of the site (based on aerial photo interpretation of features that may provide potential breeding habitat). Both species observed outside of the Subject Lands are provincially ranked S5 (common and secure) or S4 (apparently common and secure) and were observed at a call count level of 1, with one calling individual.

Full survey results are provided in **Table 5 (Appendix A.1.2)**. A description of each station and a summary of the recorded calling amphibians are provided below:

- AMC Station 1 was located within a disturbed area associated with HDF WHT2(2)1-1a on the Subject Lands. No wetland feature was identified in this area.
 - Water was not present during any of the rounds. No species were heard calling from this feature, and no species were heard calling from offsite while at this station.
- AMC Station 2 was located within a CUM/DIST community associated with HDF WHT2(2)1-1a on the Subject Lands. No wetland feature was identified in this area.
 - Water was not present during any of the rounds. No species were heard calling from this feature, and no species were heard calling from offsite while at this station.
- AMC Station 3 is located adjacent to an offsite MAM2-2 community along HDF WHT1(6)4-1.
 - Water was not present during any of the rounds. No species were heard calling from this feature; one American Toad was heard calling from offsite while at this station.
- AMC Station 4 is located within an a CUM1-1 community within the West Humber River valleyland on the Subject Lands. No wetland feature was identified in this area, although wetland vegetation is present along the West Humber River channel.
 - Water was not present during any of the rounds. No species were heard calling from this area, and no species were heard calling from offsite while at this station.
- AMC Station 5 is associated with the upstream end of HDF WHT1(6)3-1 on the Subject Lands (just south of the Healey Road).
 - Water was not present during any of the rounds. No species were heard calling from this feature. One Western Chorus Frog was heard calling from offsite greater than 120 m away.

2.4.6.4 Snakes

No snakes were observed within the NH Study Area despite survey effort. Full survey details are provided in **Table 6 (Appendix A.1.2)**.

2.4.6.5 Terrestrial Crayfish

No Terrestrial Crayfish chimneys were observed within the NH Study Area despite survey effort.

2.4.6.6 Incidental Observations

Incidental wildlife observations were recorded during surveys conducted by GEI in 2022, 2023, 2024, and 2025. Evidence such as direct sightings, calls, tracks, scat, and runways was used to identify wildlife present within the NH Study Area. These observations contributed to documenting wildlife and wildlife habitat, as well as characterizing the nature, extent, and significance of animal activity in the area.

Species documented incidentally within the NH Study Area during the 2022 to 2025 ecological field surveys are listed below, excluding those already reported in other sections as part of targeted wildlife surveys:

- Mammals:
 - Coyote (*Canis latrans*) – S5;
 - White-tailed Deer (*Odocoileus virginianus*) – S5; and
 - Virginia Opossum (*Didelphis virginiana*) – S4
- Insects:
 - Cabbage White (*Pieris rapae*) – SNA; and
 - European Skipper (*Thymelicus lineola*) - SNA

2.4.7 Aquatic Survey Results

The following subsections present the results of the AHA and HDFA surveys conducted by GEI within the NH Study Area.

2.4.7.1 Watercourse Overview and Reach Delineation

The Subject Lands are located within the Humber River watershed, in the West Humber River subwatershed within the TRCA's jurisdiction. The Humber River watershed encompasses 900 km² of land, including portions of the municipalities of Caledon, King, Brampton, Mississauga, and Toronto (TRCA 2023). Four regulated watercourses and one HDF were identified on site through TRCA regulatory mapping (TRCA 2025) and the Settlement Area Boundary Expansion (Map SM1-20 of the SABE Phase 2, Part A, Appendix E; Peel 2022), including:

- A portion of the West Humber River labelled WHT2(2) in the SABE
- Watercourse WHT2(2)1-1a near the southern boundary of the Subject Lands;
- Watercourse WHT1(6)3-1 extending through the centre of the Subject Lands;
- Watercourse WHT1(6)4-1 in the northeast corner of the Subject Lands; and
- HDF WHT1(6)2-1 extending through the centre of the Subject Lands

Based on investigations to ground-truth the results of the SABE, HDF WHT1(6)2-1 was not present on site and therefore is not discussed further in this report. Ultimately, field investigations characterized two watercourses and two HDFs within the Subject Lands. The two on-site watercourses include the West Humber River (i.e., WHT2(2)) and WHT1(6)4-1 in the northeast corner of the Subject Lands (see **Figure 5, Appendix A.1.1**); these watercourses are discussed in more detail below. The remaining two features (WHT2(2)1-1a and WHT1(6)3-1) were determined to be HDFs and are discussed in **Section 2.4.7.2**.

2.4.7.2 Aquatic Habitat Assessments

The West Humber River crosses the southwestern corner of the NH Study Area within the Greenbelt Plan Area. An aquatic habitat assessment of feature WHT2(2) was completed on August 17, 2022. The West Humber River is a permanently flowing watercourse with a vegetated riparian corridor of various wet meadow vegetation, such as Reed Canary Grass (*Phalaris arundinacea*), Joe Pye Weed (*Eutrochium maculatum*), and various *Scirpus* species. Instream habitat was provided by eroded banks, overhanging grasses and dispersed aquatic vegetation such as Common

Arrowhead (*Sagittaria latifolia*).

As noted in Section 2.4.7.4, no fish community surveys were completed in this watercourse, given its location in the protected valleyland in the Greenbelt and that the feature is identified as providing Critical Habitat for Redside Dace. Ontario GeoHub Aquatic Resource Area Survey Point data indicates that the following species were captured at a sampling point on the West Humber River just upstream from Healey Road in 1972:

- Blackchin Shiner (*Miniellus heterodon*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Blacknose Shiner (*Notropis heterolepis*)
- Bluntnose Minnow (*Pimephales notatus*)
- Common Shiner (*Luxilus cornutus*)
- Creek Chub (*Semotilus atromaculatus*)
- Fantail Darter (*Etheostoma flabellare*)
- Iowa Darter (*Etheostoma exile*)
- Johnny Darter (*Etheostoma nigrum*)
- White Sucker (*Catostomus commersonii*).

This species assemblage is generally typical of permanently flowing creeks and small rivers with a cool-water thermal regime. This feature was identified as a High Constraint watercourse in the SABE Scoped SWS (Wood et al., 2022). Given its permanency, form and function and presence within a confined valleyland, the High Constraint ranking is carried through this LSS.

Watercourse WHT1(6)4-1 conveys flow across the northeastern corner of the Subject Lands (**Figure 5 Appendix A.1.1**). Through on-site investigations completed by GEI, WHT1(6)4-1 was originally assessed as a HDF, consisting of a headwater swale within an active agricultural field. The feature originates from a man-made pond north of Healey Road, flowing across the Subject Lands and continuing off-site in a southeast direction to merge with The Gore Road Tributary. WHT1(6)4-1 was observed to flow in the spring but had isolated pockets of standing water in

rounds 2 and 3, suggesting the feature to be intermittent. A channel has eroded through the agricultural field on the Subject Lands (due in part to general lack of stabilizing riparian vegetation due to historic agricultural practices), creating varying degrees of bed and bank definition. While on-site investigations initially identified WHT1(6)4-1 as an HDF, further discussion with TRCA has resulted in the classification of this feature as a watercourse and it is treated as such within this LSS report. As noted in **Section 2.4.7.4**, this feature provides direct seasonal fish habitat.

This watercourse was identified in the SABE Scoped SWS (Wood et al, 2022) as a Low Constraint watercourse and it was identified that these types of features may be re-evaluated as HDFs. However, based on TRCA's determination of this drainage feature to be a watercourse on the Subject Lands, this feature is more appropriately identified as a Medium Constraint watercourse. This constraint ranking is carried through this LSS.

2.4.7.3 Headwater Drainage Feature Assessment

As shown in **Figure 5 (Appendix A.1.1)**, two HDFs were identified and evaluated within the NH Study Area. These features were divided into specific reaches based on the guidance for reach delineation in the HDFA Guidelines. A full evaluation of these features is provided in **Table 7 (Appendix A.1.2)**.

Both features were identified in the SABE Scoped SWS (Wood et al, 2022) as Medium Constraint watercourses while traversing the agricultural portions of the Subject Lands, with WHT2(2)1-1 transitioning to a High Constraint Watercourse where it flows off site.

The physical and biological characteristics of both features and their reaches are summarized below:

WHT2(2)1-1a

Headwater drainage feature WHT2(2)1-1a is characterized as a swale consisting of one reach on the Subject Lands. The feature has not been observed to be flowing during any of the 2023 or 2024 field investigations. WHT2(2)1-1a is believed to have been associated with the residential/farm

structure area which previously existed at the top end of the feature and was identified as originating from the former tile drainage outlet. Based on field data, the feature is now dry, with exception of potentially conveying flow during storm events.

This feature was identified in the SABE Scoped SWS (Wood et al, 2022) as a Medium Constraint watercourse in the agricultural portion of the Subject Lands, transitioning to a High Constraint Watercourse where it runs through the Buckthorn Deciduous Shrub Thicket adjacent to the Subject Lands.

As previously mentioned, this feature was identified as an HDF based on on-site investigations; however, dialogue with TRCA is ongoing for drainage features within the Subject Lands, and a site visit to examine the HDFs with TRCA and GEI is expected in 2026.

For the purposes of this LSS, the portion of the reach in the agricultural field on the Subject Lands has been assessed as an HDF. As outlined in **Table 7 (Appendix A.1.2)**, based on lack of observed downstream flow during multiple years of survey, this feature is identified as No Management Required in accordance with the classification in the HDFFA Guidelines.

The reach located downstream from the Subject Lands (WHT2(2)1-1b) was not able to be assessed by GEI due to property access limitations. Therefore, the designation from the SABE Scoped SWS (Wood et al., 2022) of High Constraint Watercourse is carried through this LSS.

WHT1(6)3-1

WHT1(6)3-1 is located within an active agricultural field consisting of two reaches within the Subject Lands: WHT1(6)3-1(a) and WHT1(6)3-1(b). WHT1(6)3-1 originates from the culvert at Healey Road, conveying flow across the Subject Lands and off-site towards The Gore Road Tributary. In 2023, both reaches of WHT1(6)3-1 were observed to be flowing in the spring and had isolated pockets of standing water during HDFFA rounds 2 and 3. In 2024, similar conditions were observed during HDFFA round 1; however, both reaches displayed fewer isolated pockets of standing water during HDFFA round 2 in 2024, and both were dry during the round 3 assessment in summer (aside from a deep pool of water at the northern end of WHT1(6)3-1(a) near the culvert

under Healey Road). These results suggest WHT1(6)3-1 is an ephemeral to intermittent feature. Electrofishing was undertaken along WHT1(6)3-1 on March 3, 2023, and confirmed the absence of fish within both reaches.

The feature was identified in the SABE Scoped SWS (Wood et al., 2022) as a Medium Constraint watercourse. As previously mentioned, this feature was identified by GEI as an HDF based on on-site investigations. However, during the July 2025 site visit, TRCA indicated that the approximately upper 2/3s of the feature on the Subject Lands met the criteria to be a regulated watercourse based on the presence of defined bed and banks. The downstream most ~1/3 of the feature lacked defined bed and banks during the assessment. TRCA staff indicated that they would need to observe this portion of the feature during the spring period to determine if it met the criteria to be a watercourse (i.e., if spring flows created bed and banks).

Based on GEI's observations, defined bed and banks have been created in the upstream portion of the watercourse due to historical agricultural practices (which have removed riparian vegetation and created destabilization of the riparian soils) in this slightly higher gradient reach and should not be considered the only factor in determining whether this feature should be considered a regulated watercourse. The lower gradient downstream portion of the feature does not appear to have sufficient stream power to erode bed and banks, even in the absence of stabilizing vegetation.

Therefore, given the observed on-site conditions including lack of definition in the downstream reach, erosion in the upstream reach due to higher gradient conditions and lack of stabilizing riparian vegetation, and the ephemeral flow regime, combined with the relatively small drainage area (22 ha), the feature should not be considered a regulated watercourse. The feature is more appropriately classified as a non-regulated HDF. A site visit to examine this feature with TRCA is expected to occur in spring in 2026.

The HDF has been observed flowing in early spring 2023, with standing water pockets being observed in the feature in late spring and summer 2023 (which was considered to be an uncharacteristically wet season). No downstream flow was observed in the feature at any point during the HDFA in 2024. Based on the presence of pockets of standing water in summer 2023,

the feature would warrant “Protection” based on the HDFA guideline. However, based on the lack of observed downstream flow in 2024, the feature would warrant “No Management Required” based on the HDFA Guideline. Given the presence of spring flows in some years (which is expected to be highlight ephemeral in nature), a management recommendation of Mitigation has been identified for the feature in this LSS.

Management Recommendations

The flow chart shown in the Credit Valley Conservation/Toronto Region and Conservation Authority (CVC/TRCA) 2014 “Evaluation, Classification and Management of Headwater Drainage Features Guidelines” was used to determine the management recommendation for the HDFs on the Subject Lands. The resulting management recommendations for each reach are depicted in **Table 7 (Appendix A.1.2)**.

It is important to acknowledge that as with any guidelines, the HDFA Guidelines are intended to have flexibility to best reflect additional considerations regarding the site-specific nature of features, such as historical straightening for agricultural purposes, impairment related to surrounding agriculture, the replication of contributing habitat functions, and compatibility with land uses. As such, there are situations where recommendations are made for an alternative management recommendation based on site specific understanding of these additional factors.

Stringent application of the HDFA Guidelines to the HDFs on the Subject Lands would result in management recommendations of ‘protection’ for WHT1(6)3-1(a) and WHT1(6)3-1(b). As described above, water was present in both reaches during all three assessment rounds in 2023; this initially resulted in the management recommendations for these two reaches being elevated because of their “Important” hydrology. However, given that 2023 was uncharacteristically wet, this is not an accurate representation of the normal hydrologic conditions as captured in 2024, where both reaches were determined to be dry by HDFA round 3, thereby resulting in “Valued” hydrology. In recognition of 2024 hydrology as well as the agricultural impacts to these features (i.e., historical siltation due to ploughing near the edge of the feature and potential pollution due to fertilizers), reaches WHT1(6)3-1(a) and WHT1(6)3-1(b) have been assigned a site-specific

management recommendation of ‘Mitigation’ based on their “Valued” hydrology.

Management recommendations and recommended management approaches for each management classification (from the HDFA Guidelines) for each reach are summarized below:

- **Mitigation - WHT1(6)3-1(a) and WHT1(6)3-1(b)**
 - 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); and
 - Replication 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
- **No Management Required - WHT2(2)1-1a**
 - The feature that was identified during desktop pre-screening has been field verified to confirm that no features 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.

2.4.7.4 Fish Community Sampling

Fish community sampling was completed by GEI on March 3, 2023. Drainage features WHT1(6)3-1 and WHT1(6)4-1 were both sampled to confirm the presence or absence of direct fish habitat

within the features. A single Fathead Minnow (*Pimephales promelas*) was captured during spring fish community sampling at the upstream end of reach WHT1(6)4-1 at the Healey Road culvert.

No fish were captured at the downstream end of WHT1(6)4-1 or within any part of WHT1(6)3-1.

2.5 Analysis of Ecological and Natural Heritage Significance

This section evaluates the presence, significance, and regulatory considerations of natural heritage features within the Subject Lands and the adjacent 120 m, as defined by the PPS (MMAH 2024) and evaluates KNHFs and KHF's per the Greenbelt Plan (MMA 2017a) and significant natural heritage features per the Peel Regional Official Plan (2022) and the Town of Caledon Official Plan (2025), TRCA-regulated features under O. Reg. 41/24, and requirements under the *Endangered Species Act*.

2.5.1 Provincial Planning Statement

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

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

The presence or absence of these features within the NH Study Area is discussed in the following

subsections. Guidance from the NHRM (MNR, 2010), and related documents, was used to assess the potential significance of natural heritage features and their associated functions.

2.5.1.1 Significant Wetlands

Within Ontario, PSWs are identified by the MNR or by their designates (e.g., Ontario Wetland Evaluation System (OWES) certified wetland evaluators). Other evaluated or unevaluated wetlands may be identified by the Town of Caledon, TRCA, or by GEI during site-specific ecological surveys. Wetlands are defined in the NHRM (MNR 2010) as:

“...lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.”

Based on the ecological surveys completed by GEI, the following wetland units are currently present within the NH Study Area (**Figure 6, Appendix A.1.1**):

Wetlands on the Subject Lands

- One area of (OA) and Mineral Shallow Marsh (MAS2) / Mineral Meadow Marsh (MAM2) along the West Humber River (within the Subject Lands and adjacent 120 m upstream and downstream);
- An area of Reed-canary Grass Mineral Meadow Marsh (MAM2-2) partially on the Subject Lands (as staked with TRCA on July 23, 2025), but primarily east of the Subject Lands (within and beyond 120 m) that is associated with WHT1(6)3-1 and the Gore Road Tributary [WHT1(6)];
- Three small areas of wetland vegetation (ranging in size from 12 to 247 m²) that were staked with TRCA on July 23, 2025. These features are associated with HDF WHT1(6)3-

1 and watercourse WHT1(6)4-1;

Wetlands within 120 m of the Subject Lands

- An ~0.097 ha Swamp Maple Mineral Deciduous Swamp (SWD3-3) outside of the Subject Lands across The Gore Road;
- An ~0.043 ha Cattail Mineral Shallow Marsh (MAS2-1) outside of the Subject Lands across The Gore Road; and

These wetlands are all considered to be unevaluated wetlands, since they have not been evaluated in accordance with the OWES (MNR 2022).

Where there are differences between GEI's ELC mapping and existing wetland mapping (i.e., MNR GeoHub mapping), GEI's mapping is considered more accurate as it reflects current site conditions based on detailed field surveys and feature staking with the TRCA and the Town of Caledon.

2.5.1.2 Significant Coastal Wetlands

Within Ontario, Significant Coastal Wetlands are identified by the MNR or by their designates. Coastal wetlands are defined in the NHRM (MNR 2010) as:

- a) "any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or*
- b) any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected."*

There are no coastal wetlands located within the NH Study Area.

2.5.1.3 Significant Woodlands

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

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

For the purposes of delineating woodlands, provincial guidance provided in the NHRM (MNR 2010) and the Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area (MNR 2012) and municipal guidance in the Peel and Caledon Official Plans were used. Treed areas separated by more than 20 m are considered separate woodlands. Contiguous agricultural hedgerows and narrow woodland patches are included as part of a woodland if they have a minimum average width of at least 40 m, and narrower sections meet a length-to-width ratio of 3:1 or less. Undeveloped clearings within woodland patches are generally included if the total area of each clearing is no greater than 0.2 ha.

Following the ecological surveys completed by GEI (including the dripline staking with the Town of Caledon), the treed area at the southwest end of the Subject Lands (within the Greenbelt Plan area) needs to be considered a woodland (see **Section 2.4.5.8**) based on the requirement to consider Buckthorn as a tree species. This feature has been identified as primarily Buckthorn Deciduous Shrub Thicket (THDM2-6) with a small patch of Cultural Woodland (CUW1) (**Figure 4, Appendix A.1.1**). The woodland is present both on and off-the Subject Lands. Based on on-site investigations for the portion on the Subject Lands, supplemented with aerial photograph interpretation for the portion off the Subject Lands, the overall size of the woodland was

determined to be 3.28 ha.

The CUW1 feature within the Subject Lands near The Gore Road (within the Greenbelt Plan area) is less than 0.5 ha in size and did not meet the criteria to be considered a significant woodland in the Greenbelt, nor a woodland per the requirements of Regional Greenlands System or Town of Caledon and therefore is not assessed further for significance (see **Section 2.4.5.8**).

Additional treed features (FOD, FOD5-1, SWD3-3 and CUW1) are also located outside of the Subject Lands within the adjacent 120 m. In the absence of offsite survey access to assess these features against ‘woodland’ criteria (see **Section 2.4.5.8**) these features have been conservatively assumed to meet woodland criteria.

All woodlands are located in the Greenbelt Plan Area. As such, they will be evaluated according to the significant woodland criteria of the Greenbelt Plan and associated technical paper (MNR 2005). This evaluation is outlined in the Greenbelt Plan section below.

Greenbelt Plan Woodland Significance Assessment

The Greenbelt Plan (MMA 2017) 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 [...]”

The *Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area* (MNR, 2012) provides criteria for the evaluation of significant woodlands based on their geographic location in relation to the Oak Ridges Moraine Conservation Plan area. The Subject Lands are located south of the Oak Ridges Moraine, and as such, woodland significance is evaluated based on the following criteria:

- **Size:** Any woodlands 4 ha or greater are significant; or
- **Natural composition:** Any woodlands containing 1 ha or more of naturally occurring (not planted) trees listed in the table in Appendix D that meet the definition of woodland: 1 ha or more; or
- **Age or Tree Size:** Any woodlands 1 ha or greater with either: a) 10 or more trees per ha that are either greater than 100 years old or 50 cm or more in diameter; or b) containing a basal area of at least 8 m² per hectare in native trees that are 40 cm or more in diameter; or
- **Proximity:** Any woodlands 1 ha or greater wholly or partially within 30 m of a: significant wetland; significant habitat of an endangered or threatened species; significant woodland; or
- **Rarity:** Any woodlands 0.5 ha or greater containing: a provincially rare, treed vegetation community with an S1, S2, or S3 in its ranking by the MNR's NHIC; or habitat of a woodland plant species with an S1, S2, or S3 in its ranking or an 8, 9, or 10 in its Southern Ontario Coefficient of Conservatism by the NHIC, consisting of 10 or more individual stems or 100 m² or more of leaf coverage.

The woodland within the southwest corner of the Subject Lands (CUW1/THDM2-6) meets the significance criteria for proximity (i.e., to Redside Dace habitat within the West Humber River, which extends 30 m from the meander belt and therefore encompasses part of the woodland) and therefore is identified as a significant woodland as shown in **Figure 7 (Appendix A.1.1)**. In addition to meeting Greenbelt Plan significant woodland criteria, the woodland also meets criteria to be a NAC woodland under the Peel Region OP and a Supporting Feature and Area under the Town of Caledon OP.

Offsite within the adjacent 120 m, the FOD woodland, and the FOD/SWD3-3/FOD5-1 woodland feature across The Gore Road also meet the significance criteria for proximity (i.e., to Redside Dace habitat in the West Humber River), and are therefore identified as significant woodlands, as shown in **Figure 7 (Appendix A.1.1)**. Although located within 120 m of the Subject Lands, these offsite woodlands are located >120 m from the proposed limit of development and site

alteration.

Significant Woodlands are Key Natural Heritage Features in the Greenbelt Plan Area, and a 30 m VPZ would be required from the staked dripline of the woodland, per Greenbelt Plan policies.

The cultural woodland (CUW1) located to the south of the Subject Lands does not meet the minimum size threshold of 0.5 ha to be considered a significant woodland.

2.5.1.4 Significant Valleylands

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

Additional detailed criteria for identifying significant valleylands are provided in the Greenbelt Plan *Technical Paper 1: Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area* (MNR, 2012). These criteria include features such as a well-defined valley morphology and an average width of 25 m or more.

Valleyland physical top of bank on the Subject Lands was staked with TRCA in December 2024. Two top of bank areas were staked at this time:

- Top of bank associated with the West Humber River; and
- Top of bank associated with HDF WHT2(2)1-1a

As a major valley system, the West Humber River valley has been assumed to meet criteria to be a Significant Valleyland based on the criteria in the *Greenbelt Technical Guide*. Therefore, it is a Key Natural Heritage Feature under the definitions in the Greenbelt Plan Area.

While a portion of WHT2(2)1-1a top of bank was staked with TRCA in 2024, it is GEI's opinion, based on the criteria outlined in the NHRM and the Greenbelt Plan Technical Paper, that the area

along WHT2(2)1-1a should not be considered a valleyland due to the following:

- This area functions as a draw associated with the WHT2(2)1-1a HDF (recommended for No Management in accordance with the HDF Guideline evaluation approach). The portion within the staked top of bank on the Subject Lands does not contain a watercourse;
- There is no regulatory floodplain associated with the portion of the staked feature on the Subject Lands based on TRCA Regulation mapping;
- This portion of the staked feature has historically been used for agricultural purposes, and has previously been ploughed and planted throughout its extent on the Subject Lands; and
- Alterations to this portion of the staked feature (e.g., filling for construction of a SWM pond) are not expected to have any negative impact on downstream (off-site) hazards.

Based on the rationale outlined above, the portion of staked top of bank along WHT2(2)1-1a is not treated as a valleyland in this report and staked linework associated with this feature is therefore not depicted in any figures. It is noted that correspondence with TRCA is ongoing related to this feature including an expected site visit in spring 2026 to review and confirm the HDF present within the area and discuss the previous top of bank staking. The staked top of bank along the West Humber River is shown in **Figure 3 (Appendix A.1.1)**.

2.5.1.5 Significant Wildlife Habitat

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

There are four broad categories of SWH: seasonal concentration areas, rare vegetation

communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. The following subsection discusses each of these broad categories in relation to the Subject Lands. Additional details on the SWH analysis are provided in **Table 8 (Appendix A.1.2)**, and the locations of identified SWH types are shown in **Figure 8 (Appendix A.1.1)**.

Seasonal Concentration Areas

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

The following Seasonal Concentration Area SWH types were noted within the NH Study Area:

- Within the Subject Lands
 - Candidate Turtle Wintering Area SWH (Within the West Humber River in the Greenbelt Plan area)
- Adjacent 120 m
 - Candidate Turtle Wintering Area SWH (within the West Humber River in the Greenbelt Plan area and in the wetlands)
 - Candidate Bat Maternity Colony SWH (within the FOD/SWD woodland west of The Gore Road).

Rare Vegetation Communities or Specialized Wildlife Habitat

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

No rare vegetation communities were identified within the Subject Lands or the adjacent 120 m.

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

No Specialized Wildlife SWH types were noted within the Subject Lands; however, the following Specialized Wildlife Habitat SWH types were noted within the adjacent 120 m (both within the FOD/SWD on the west side of The Gore Road):

- Candidate Bald Eagle and Osprey SWH; and
- Candidate Seeps and Springs SWH.

Habitat for Species of Conservation Concern

Species of conservation concern include those that are Special Concern and provincially rare (S1–S3, SH). Several specialized wildlife habitats are also included in this SWH category, such as terrestrial crayfish habitat and significant breeding bird habitats for marsh, open country, and early successional bird species. Habitat of species of conservation concern does not include habitats of Endangered or Threatened species as identified by the *Endangered Species Act*. **Section 2.5.1.9** discusses Endangered and Threatened species.

The following Special Concern and Rare Wildlife Species SWH was noted within the NH Study Area:

- Within the Subject Lands
 - Candidate habitat for American Brook Lamprey (within West Humber River)
 - Candidate habitat for Snapping Turtle (within West Humber River)
- Adjacent 120 m
 - Candidate Marsh Breeding Bird Habitat (within wetlands)
 - Candidate habitat for Terrestrial Crayfish (within wetlands)
 - Candidate habitat for Eastern Wood-Pewee (within the FOD/SWD)
 - Candidate habitat for American Brook Lamprey (within West Humber River)
 - Candidate habitat for Snapping Turtle (within West Humber River)
 - Candidate habitat for Upland Sandpiper (in the agricultural fields west of The Gore Road).

Animal Movement Corridors

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

For ecoregion 6E, animal movement corridors include Amphibian Movement Corridors (a required component of Wetland Amphibian Breeding Habitats SWH) and Deer Movement Corridors (a required component of Deer Yarding Areas and Deer Winter Congregation Areas). As none of these SWH types exist within the NH Study Area, animal movement corridors are also

absent.

2.5.1.6 Fish Habitat

“Fish habitat” is defined in the federal *Fisheries Act, 1985* as “water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.” The definition for “fish” includes “(a) parts of fish, (b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and (c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.”

Fish community sampling identified direct fish habitat within WHT1(6)4-1 in the northeastern corner of the Subject Lands (**Section 2.4.7.3**). The West Humber River and the southern portion of WHT2(2)1-1a where it enters the Buckthorn Deciduous Shrub Thicket (THDM2-6) outside the Subject Lands are also assumed to provide direct fish habitat. Indirect fish habitat is present in WHT1(6)3-1, given the ephemeral flow conveyance to the Gore Road Tributary. The tablelands portion of WHT2(2)1-1a within the Subject Lands is not identified as providing an indirect fish habitat function, given the lack of observed downstream flow during HDF assessments.

Outside of the Subject Lands, within the adjacent 120 m, candidate direct fish habitat has been assumed for unevaluated drainage features unless a feature runs entirely through agricultural lands.

Figure 5 (Appendix A.1.1) summarizes direct and indirect fish habitat within the NH Study Area (i.e., the Subject Lands and adjacent 120 m).

2.5.1.7 Habitat of Endangered and Threatened Species

Endangered and Threatened species are those identified on the SARO list (O. Reg. 230/08). Species designated as Threatened or Endangered in Ontario are afforded both individual and habitat protection under ESA (2007), whereas species designated Special Concern are not afforded protection under the ESA but are instead assessed as SWH (as discussed above within **Section 2.5.1.5**).

The SABE Reports did not comprehensively map or identify SAR and SAR habitat; rather, this component was deferred to the local SWS to assess. The only exception to this is the identification of Redside Dace habitat within Figure DA2-8G (Redside Dace Component of the Preliminary Natural Heritage System) within the Phase 2 SABE Scoped SWS Report (Appendix E). As previously noted, Redside Dace habitat is identified within the West Humber River.

GEI reviewed existing background information and identified known SAR records from the broader landscape surrounding the Subject Lands, as summarized in **Section 2.4.4**. Furthermore, GEI completed targeted ecological field surveys on the Subject Lands, the results of which are summarized in **Sections 2.4.5 - 2.4.7**.

The Endangered and Threatened species identified through background review (**Section 2.4.4**) were also evaluated to determine their presence and the potential for suitable habitat within the NH Study Area, based on GEI's ecological field survey results. The results of this evaluation are presented in **Table 9 (Appendix A.1.2)** and **Figure 9 (Appendix A.1.1)** and are summarized below.

- Within the Subject Lands:
 - Confirmed habitat for Redside Dace – endangered in Ontario; and
 - Candidate habitat for SAR Bats – endangered in Ontario
- Adjacent 120 m:
 - Confirmed habitat for Redside Dace;
 - Candidate habitat for SAR bats; and
 - Candidate habitat for Eastern Meadowlark – threatened in Ontario.

Each species and its occurrence are discussed below.

Redside Dace

DFO Aquatic Species at Risk mapping indicates that the West Humber River provides Critical Habitat for Redside Dace. As per the Recovery Strategy and Action Plan for the Redside Dace (*Clinostomus elongatus*) in Canada (DFO, 2024) Critical Habitat is generally defined as the bankfull channel, areas within the meander belt and vegetated areas within 30 m of the meander belt. The limit of Redside Dace Critical Habitat associated with the West Humber River on the Subject Lands is depicted in **Figure 9 (Appendix A.1.1)**. This area is also currently protected under the provincial ESA. However, when the ESA is repealed and the Species Conservation comes into force (as discussed previously in Section 2.2.7), it is expected that MECP will relinquish jurisdiction over aquatic species at risk (including Redside Dace), such that DFO would be sole regulator for the species and its habitat.

MECP previously regulated contributing Redside Dace habitat (i.e., habitat where the species is not present, but which may support downstream habitat) under the ESA. However, with the revised definition of habitat in the 2025 revision to the ESA, contributing habitat is no longer regulated by MECP. Therefore, while watercourse WHT2(2)1-1b may assist in supporting the Redside Dace habitat function the West Humber River, it not regulated as Redside Dace habitat by MECP nor are they identified as Critical Habitat by DFO.

The Gore Road Tributary does not confluence with a portion of the Humber River that provides habitat for Redside Dace, therefore, it provides no supporting Redside Dace habitat functions.

SAR Bats

A bat habitat assessment was completed within the Greenbelt Plan Area in the southwest corner of the Subject Lands. Nine potentially suitable snags were recorded in this location (see **Figure 9, Appendix A.1.1**). Despite the presence of potentially suitable snags, no acoustic surveys were completed in this location due to the high likelihood of interference from offsite calls; therefore, the CUW1 and THDM2-6 communities within the Greenbelt Plan Area have conservatively been assumed to provide candidate habitat for SAR bats.

In addition, several deciduous treed areas, including CUW1, SWD3-3, FOD, and FOD5-1 communities, are located within 120 m of the Subject Lands and may provide SAR bat habitat. Due to site access, it was not possible to complete a formal bat habitat assessment within offsite features; therefore, these features are conservatively assumed to provide candidate habitat for SAR bats.

Eastern Meadowlark

While no suitable habitat for Eastern Meadowlark was observed within the Subject Lands (see **Section 2.4.6.1**), suitable habitat may be present within hayfields to the west, across The Gore Road as several calling individuals were heard near this area during breeding bird surveys. In the absence of survey access offsite, fields and cultural meadows across The Gore Road have conservatively been assumed to provide candidate habitat for Eastern Meadowlark.

2.5.1.8 Significant Areas of Natural and Scientific Interest

ANSIs are identified by the MNR as areas with provincially or regionally significant and representative geological or ecological features that provide life science or earth science values related to protection, scientific study, or education.

There are no ANSIs located within the NH Study Area.

2.5.2 Greenbelt Plan

The southwestern portion of the NH Study Area is designated as Protected Countryside within the Greenbelt Plan Area. The Greenbelt NHS overlay designation is also applied to the area. The Greenbelt Plan (2017a) sets out policies to protect KNHFs and KHF, as described in **Section 2.2.2**.

The following KNHFs, KHF, and KHAs were identified within the Greenbelt Plan Area, located in the southwest corner of the NH Study Area:

- Identified **KNHFs** include the following:

- Candidate and confirmed habitat of Endangered and Threatened species (see **Section 2.5.1.7**);
- Direct and indirect fish habitat (see **Section 2.5.1.6**);
- Wetlands (see **Section 2.5.1.1**);
- Significant woodlands (see **Section 2.5.1.3**);
- Significant valleylands (see **Section 2.5.1.4**);
- Candidate SWH (see **Section 2.5.1.5**).
- Identified **KHFs** include the following:
 - Permanent and intermittent streams (see **Section 2.4.7.1**); and
 - Wetlands (see **Section 2.5.1.1**).
- Identified **KHAs** include the following:
 - Highly Vulnerable Aquifers (see **Section 2.2.3** and **2.2.4**)

In accordance with Section 3.2.5 of the Greenbelt Plan (MMAH 2017), a minimum VPZ of 30 m is required for fish habitat, wetlands, significant woodlands, permanent and intermittent streams, lakes, and seepage areas and springs. All other KNHFs and KHFs require a VPZ which “is of sufficient width” to protect its form and function from the impacts of the proposed development.

2.5.3 Peel Region and Town of Caledon Official Plans

The following components of the **Greenlands System** of the Peel Regional Official Plan (2022) were identified within the NH Study Area:

- Core Areas designated and shown on Schedule C-2:

- Valley and stream corridors meeting one or more of the criteria for Core Area valley and stream corridors in Table 2 of the regional Official Plan (West Humber River - see **Section 2.5.1.4**)
- Natural Areas and Corridors:
 - Woodlands meeting one or more of the criteria for NAC woodland in Table 1 of the regional Official Plan (see **Section 2.5.1.3**);
 - Candidate SWH (see **Section 2.5.1.5**);
 - Indirect and direct fish habitat (see **Section 2.5.1.6**);
 - Habitat of an aquatic Species at Risk (see **Section 2.5.1.7**);
 - Candidate and confirmed habitat of Endangered and Threatened species (see **Section 2.5.1.7**); and
- Potential Natural Areas and Corridors:
 - Unevaluated wetlands (see **Section 2.5.1.1**); and
 - Enhancement areas, buffers, and linkages
- The NHS overlay of the Greenbelt Plan (see **Section 2.5.2**); and

The Region does not provide buffer/setback requirements; rather, it defers to the Greenbelt Plan or Town's requirements, as applicable.

The following components of the **Natural Environment System** of the Caledon Official Plan (2025) were identified within the NH Study Area:

- Core Areas of the Greenlands System (see write-up above) with the following corresponding **Natural Features and Areas**;

-
- Significant valleylands (West Humber River - see **Section 2.5.1.4**); and
 - Valley and stream corridors meeting one or more of the criteria for Core Area valley and stream corridors in Table 2 (West Humber River - see **Section 2.5.1.4**)
 - Natural Areas and Corridors and Potential Natural Areas and Corridors of the Greenlands System (see paragraph above) with the following corresponding **Supporting Features and Areas**:
 - Unevaluated wetlands on and adjacent to the Subject Lands (see **Section 2.5.1.1**);
 - Woodlands meeting one or more Table 1 criteria for NAC woodlands (woodlands in Greenbelt Plan area - see **Section 2.5.1.3**);
 - Candidate SWH (see **Section 2.5.1.5**);
 - Indirect and direct fish habitat (see **Section 2.5.1.6**);
 - Habitat of an aquatic Species at Risk (Redside Dace - see **Section 2.5.1.7**);
 - Candidate and confirmed habitat of Endangered and Threatened species (see **Section 2.5.1.7**); and
 - Enhancement areas, buffers, and linkages
 - The NHS overlay of the Greenbelt Plan (see **Section 2.5.2**);
 - The water resource system consisting of the following:
 - Permanent and intermittent streams (see **Section 2.4.7.1**);
 - Highly Vulnerable Aquifers (see **Section 2.2.4**); and
 - Wetlands (see **Section 2.5.1.1**)
-

Section 13.10.5 of the Future Caledon Official Plan (2025) states that “minimum buffer widths will be established in local subwatershed or equivalent studies prepared to the satisfaction of the Town”. Section 13.10.6 further states that “final buffer width(s) within New Community Areas and New Employment Areas will be determined through an environmental impact study, prepared to the satisfaction of the Town.” As a result, the minimum buffer widths presented within Section 13.9 do not apply.

2.5.4 Toronto and Region Conservation Authority

The West Humber River, discussed in **Section 2.4.7.1**, is a regulated watercourse with associated flooding and erosion hazards. Given that the West Humber River is located within a confined valleyland, the extent of the erosion hazard is defined by the long-term stable slope. However, the meander belt limits associated with the watercourse were determined by GEI to support the identification of Redside Dace habitat and are discussed further in the fluvial geomorphology sections of this LSS (**Section 3**). Flooding and erosion hazards and associated 15 m regulatory setbacks are regulated by TRCA. All wetlands identified within the NH Study Area are also TRCA-regulated features, along with their 30 m areas of interference.

Within Section 7.3.1.4 of *The Living City* (2014) policies, the following setbacks are prescribed for natural hazards:

- 10 m buffer from the greater of long-term stable top of slope/bank, stable toe of slope, regulatory floodplain and/or meander belt; and
- 30 m buffer from PSWs or a 10 m buffer for all other wetlands.

Other natural heritage setbacks provided within *The Living City* (2014) are not included here, as the TRCA no longer provides comments on natural heritage considerations.

2.5.5 Species at Risk Requirements

As outlined in **Table 9 (Appendix A.1.2)** and **Section 2.5.1.7** the following Endangered or

Threatened species or their habitats were confirmed within the NH Study Area through ecological field investigations:

- Within the Subject Lands:
 - Confirmed habitat for Redside Dace; and
 - Candidate habitat for SAR Bats
- Adjacent 120 m:
 - Confirmed habitat for Redside Dace;
 - Candidate habitat for SAR bats; and
 - Candidate habitat for Eastern Meadowlark.

Redside Dace

Section 29 of O. Reg. 831/21 and the Redside Dace Recovery Strategy (2024) define the limits of occupied (regulated) Redside Dace habitat as the preliminary meander belt plus vegetated areas or agricultural lands within 30 m of the preliminary meander belt.

DFO *Aquatic species at risk* mapping (DFO 2025) mapping identified Redside Dace habitat within the Greenbelt Plan Area and the adjacent 120 m to the Subject Lands associated with the West Humber River (reach WHT2(2), further discussed in **Section 3.0**). Therefore, the meander belt width has been delineated to identify the limits of Redside Dace habitat on both sides of the watercourse. The final Redside Dace habitat limits are delineated to span 130 m.

SAR Bats

Candidate SAR bat habitat was identified within the Greenbelt Plan Area and the adjacent 120 m to the Subject Lands and is expected to be retained. There are no setback requirements prescribed by MECP for SAR bats; however, suitable woodlands may be prescribed protection in

accordance with Woodland policies.

Eastern Meadowlark

Candidate Eastern Meadowlark habitat was identified within 120 m of the Subject Lands in open communities across The Gore Road. There are no setback requirements prescribed by MECP for Eastern Meadowlark; however, candidate Eastern Meadowlark habitat is not anticipated to be removed as a result of the proposed development within the Secondary Plan Area (see **Section 7.3.6** for additional information).

2.6 Existing Natural Heritage System

An NHS is defined in the NHRM (2010) as “an ecologically based delineation of nature and natural function” and “a system of connected or to be connected green and natural areas that provide ecological functions over a longer period of time and enable movement of species.”

The Healey Gore NHS will encompass natural heritage features and natural hazards, along with their associated VPZs/buffers, to ensure the protection and enhancement of these features and their ecological functions. Its primary goal is to maintain and enhance habitat, foraging opportunities, and movement corridors for as many species as possible.

The NHS boundaries may be refined in Phase 2 to incorporate watercourse realignments, ecological offsetting and/or enhancement areas within the Proposed NHS.

2.6.1 Settlement Area Boundary Expansion Preliminary Natural Heritage System

As discussed in **Section 2.2.3**, the SABE Scoped SWS (Wood et al. 2022) identified a Preliminary NHS. The Preliminary NHS for the area is shown in Figure DA214 of the SABE Scoped SWS. The Preliminary NHS included both a conceptual linkage (linkage 08, Figure DA2-10 of the Scoped SWS Part B) and a ‘shape, size, and contiguity’ enhancement area (Figure DA2-11c of the Scoped SWS Part B). However, the SABE SWS acknowledges that the Preliminary NHS was

based largely on aerial interpretation and is subject to refinement following targeted field surveys.

Accordingly, the goal of this LSS is to identify and refine the Existing NHS based on site-specific ecological field data and in accordance with the Future Caledon Official Plan (2025).

2.6.2 Healey Gore Existing Natural Heritage System

Phase 1 of this LSS has characterized and assessed the significance of natural heritage features within the NH Study Area. This information was used to delineate the Existing NHS, discussed further below. The Existing NHS is intended to supersede the Preliminary NHS of the SABE Scoped SWS.

2.6.2.1 Natural Heritage Feature Summary

GEI completed an analysis of existing natural heritage features on the Subject Lands and the adjacent 120 m (see **Section 2.4**) followed by an evaluation of their significance against provincial and municipal criteria (see **Section 2.5**). In summary, the following natural heritage features were identified within the NH Study Area:

- Unevaluated wetlands (within Subject Lands and adjacent 120 m);
- Significant woodlands (within the Subject Lands and adjacent 120 m);
- Significant valleylands (within the Subject Lands and adjacent 120 m);
- Candidate SWH:
 - Candidate Seasonal Concentration Areas:
 - Turtle Wintering Area (within the Subject Lands and adjacent 120 m)
 - Candidate Bat Maternity Colony SWH (adjacent 120 m only)
 - Candidate Specialized Wildlife Habitat:

-
- Bald Eagle and Osprey Habitat (adjacent 120 m only)
 - Seeps and Springs (adjacent 120 m only)
 - Candidate Habitat for Species of Conservation Concern:
 - Marsh Breeding Bird Habitat (adjacent 120 m only)
 - Terrestrial Crayfish (adjacent 120 m only)
 - Eastern Wood-Pewee (adjacent 120 m only)
 - American Brook Lamprey (within the Subject Lands and adjacent 120 m)
 - Snapping Turtle (within the Subject Lands and adjacent 120 m)
 - Upland Sandpiper (adjacent 120 m only)
 - Indirect and direct fish habitat (within the Subject Lands and adjacent 120 m)
 - Habitat of Endangered and Threatened species:
 - Within the Subject Lands:
 - Confirmed habitat for Redside Dace;
 - Candidate habitat for SAR bats; and
 - Adjacent 120 m:
 - Confirmed habitat for Redside Dace;
 - Candidate habitat for SAR bats; and
 - Candidate habitat for Eastern Meadowlark.
 - The NHS overlay of the Greenbelt Plan (within the Subject Lands and adjacent 120 m)
-

The locations of these features are shown in **Figures 2 to 9 (Appendix A.1.1)**.

2.6.2.2 Natural Heritage Feature Reassessment for Existing NHS

The components of the Existing NHS for the NH Study Area, as determined by GEI in accordance with the criteria outlined in Table 2.5.1.12 of the SABE SWS Part A, are shown in **Figures 2 to 9 (Appendix A.1.1)**. The resulting mapping for the Existing NHS is provided in **Figure 10 (Appendix A.1.1)**. There is considerable overlap between the Preliminary NHS and the Existing NHS; however, a comparison of the two is provided below:

- **Key Features:**

- The OA/MAS2/MAM2 wetland along the West Humber River and other, offsite wetlands within the Greenbelt Plan Area are considered KNHFs within the Greenbelt Plan and are therefore included as a Key Feature in the Existing NHS (see **Section 2.4.5.6 Figure 6, Appendix A.1.1**). This is generally consistent with Preliminary NHS mapping;
- The CUW/THDM2-6 feature in the southern portion of the Subject Lands is considered a significant woodland (see **Section 2.5.1.3, Figure 7, Appendix A.1.1**) and is therefore identified as a Key Feature in the Existing NHS. This is generally consistent with Preliminary NHS mapping;
- Within 120 m of the Subject Lands, the offsite FOD woodland, and FOD/SWD3-3/FOD5-1 complex across The Gore Road are both considered significant woodlands (see **Section 2.5.1.3, Figure 7, Appendix A.1.1**) and are therefore identified as Key Features in the Existing NHS. This is generally consistent with Preliminary NHS mapping;
- The valleyland associated with the West Humber River has been assumed to be a significant valleyland (see **Section 2.5.1.4, Figure 3, Appendix A.1.1**) and is therefore identified as a Key Feature in the Existing NHS. This is generally consistent with Preliminary NHS mapping;

- Candidate Seasonal Concentration Area, Specialized Wildlife Habitat, and Habitat for Species of Conservation Concern SWH areas have been identified as Key Features in the Existing NHS (see **Section 2.5.1.5**, and **Figure 8, Appendix A.1.1**);
 - Areas of direct fish habitat have been identified as Key Features within the Existing NHS (see **Section 2.5.1.6** and **Figure 5, Appendix A.1.1**). Several drainage features previously identified as Key Features in the Preliminary NHS are now considered Supporting Features and are discussed in the Supporting Features section below;
 - Habitat of Endangered and Threatened Species has been identified as a Key Feature in the Existing NHS (see **Section 2.5.1.7** and **Figure 9, Appendix A.1.1**);
 - **Supporting Features:**
 - The small, unevaluated wetland features staked on site with TRCA are considered supporting features (**Figure 6, Appendix A.1.1**). These wetlands were not mapped as part of the Preliminary NHS.
 - WHT1(6)3-1 was identified as a Mitigation-ranked HDF (**Figure 5, Appendix A.1.1**); therefore, this feature is included as a Supporting Feature in the Existing NHS. This HDF was previously identified as a Key Feature in the Preliminary NHS (as it was identified as a Medium Constraint watercourse in the preliminary study).
 - Areas of indirect fish habitat have been identified as Supporting Features (see **Section 2.5.1.6** and **Figure 5, Appendix A.1.1**). This includes several drainage features previously identified as Key Features in the Preliminary NHS.
 - The CUM1-1 community within the Greenbelt Plan Area in the southern portion of the Subject Lands has been identified as a Supporting Feature in the Existing NHS (**Figure 4, Appendix A.1.1**). Open Country Habitat / Shrub Successional Habitat indicator species were recorded in this location during breeding bird surveys, and this feature overlaps with occupied Redside Dace habitat within the West Humber River.
-

2.6.2.3 Ecological Setbacks

The establishment of setbacks (consisting of VPZs or buffers) from retained natural heritage features helps to protect their form and function from potential development impacts. Ecological setbacks to natural heritage features are to be established in accordance with provincial and municipal policies. Ecological setbacks under different policies were discussed in **Sections 2.5.2 to 2.5.5**. Additional discussion is provided below for each natural heritage feature type requiring setbacks.

Wetlands

Both the Greenbelt Plan (MMA 2017) and the Caledon Official Plan (2025) prescribe a 30 m setback for all wetlands, regardless of their significance.

Only unevaluated wetlands were documented within the NH Study Area (i.e., Secondary Plan Area + 120 m). Given that the current Secondary Plan Area is intended to guide future intensification and development within the Secondary Plan Area identified in the Peel Regional Official Plan (2022) and the Caledon Official Plan (2025), GEI proposes reduced setbacks of 10 m from unevaluated wetlands outside of the Greenbelt Plan Area. For unevaluated wetlands located within the Greenbelt Plan Area, setbacks would remain at 30 m as per provincial requirements. Wetlands and associated setbacks are shown on **Figure 10 (Appendix A.1.1)**.

Woodlands

The Greenbelt Plan (MMA 2017) requires a 30 m setback from Significant Woodlands where the setback is contained fully within the Greenbelt Plan Area, while the Caledon Official Plan (2025) prescribes a 20 m setback from Significant Woodlands.

GEI recommends that the current Secondary Plan Area follow the same approach. Consequently, a 30 m setback from Significant Woodlands is shown within the Greenbelt Plan Area in **Figure 10 (Appendix A.1.1)**. The setback is contained within the Greenbelt Plan area.

Valleylands

The West Humber River in the vicinity of the Subject Lands was situated in a confined valley. For confined valleyland systems, a setback from the meander belt or regulatory floodplain is not necessary, rather a setback from the greater of long-term stable top of slope/bank or stable toe of slope should be applied instead.

Although the valleyland is situated within the Greenbelt Plan area, the Greenbelt Plan does not specify a minimum VPZ for significant valleylands.

Based on site-specific considerations, GEI has applied a 5 m setback from the staked top of bank along the West Humber River valleyland. The considerations associated with specification of the 5 m setback include:

- The tableland area adjacent to the staked top of bank consists of a mix of former agricultural land and cultural meadow. The dripline of several trees within the CUW1 adjacent to the Gore Road overhangs a portion of the staked top of bank. These trees are not part of a significant natural feature, but would be expected to be protected by the 5 m buffer.
- The proposed adjacent land use will be a SWM pond. As shown in the SWM Pond design drawings, the area adjacent to the 5 m setback will consist of a 3:1 graded slope. This slope will be vegetated with native species following installation and will provide additional buffering functions for the valleyland.
- The SWM pond will be a passive complimentary land use within the Greenbelt NHS. Although construction of the SWM pond may result in temporary disturbance to wildlife use within the valleyland, over the long-term, the SWM pond will be primary vegetated and function relatively passively. No negative impacts on the valleyland form and function are expected as a result of the presence of the SWM pond over the long-term.
- One function that buffers are typically identified for is to assist in preventing ad hoc public access into the adjacent feature. However, in this instance, given the slope from the

adjacent SWM pond, pedestrian access from the SWM pond is expected to be discouraged. Targeted vegetation planting within the setback and along the slope could also discourage pedestrian access. Therefore, a larger buffer is not required to mitigate this potential effect.

- The cultural meadow and existing agricultural area between the top of bank and SWM Pond sloping is proposed for ecological restoration through vegetation planting. This is expected to enhance slope stability and form and function of the valleyland over the long-term as vegetation matures.
- The 5 m buffer will only occur over a linear distance of approximately 105 m. The actual setback of the SWM pond from the remainder of the valleyland will be 19 m or greater (in some cases >30 m) due to the 30 m VPZ from the Significant Woodland.

Therefore, based on the nature of the area and the proposed adjacent land use, the 5 m buffer is expected to be sufficient to protect the form and function of the Significant Valleyland associated with the West Humber River.

All valleyland constraints are shown in **Figure 10 (Appendix A.1.1)**.

Watercourses and Fish Habitat

The Greenbelt Plan (MMA 2017) requires a 30 m setback from fish habitat. Accordingly, a 30 m setback is applied to watercourses located within the Greenbelt Plan Area, as shown in **Figure 10 (Appendix A.1.1)**. For watercourses providing fish habitat on and within 120 m of the Subject Lands that falls outside of the Greenbelt Plan Area, a 15 m setback has been applied from the centre-line of mapped watercourse (WHT1(6)3-1) providing direct fish habitat for the purposes of the existing NHS.

Other Natural Heritage Features

There are no prescribed setbacks for other natural heritage feature types (e.g., SWH). This is consistent with provincial and municipal policies. However, these features are typically associated

with features that do have prescribed setbacks (e.g., woodlands, wetlands and watercourses, as discussed in the previous sections). An evaluation of no net negative impacts to these features or their functions will be completed as part of Phase 2 of this LSS.

2.6.2.4 Existing Natural Heritage System Mapping Summary

The Existing NHS was delineated based on the above reassessment of the natural heritage features of the NH Study Area. The outer limit of the Existing NHS was determined based on the greatest constraint, including both the natural heritage features and their associated setbacks. The updated NHS mapping for the Healey Gore (including the adjacent 120 m lands) is shown in **Figure 10 (Appendix A.1.1)**.

3.0 Fluvial Geomorphology

Four regulated watercourses were identified on the Subject Lands through TRCA regulatory mapping (TRCA 2025) and the Settlement Area Boundary Expansion (SABE; Peel 2022). One feature, the main branch of the West Humber River, which intersects a small portion of the Subject Lands, is designated as Critical Habitat for Redside Dace according to DFO mapping (DFO 2025). As a result, further assessment is required to characterize these watercourses and evaluate their associated natural hazards and habitat limits, where applicable.

A fluvial geomorphic assessment was undertaken to characterize existing channel conditions, evaluate stability, and assess the potential for erosion or morphological change. The following analyses were completed as part of the geomorphic assessment:

- Background review of all available materials, including previously completed studies for the Subject Lands, watershed reports, and topographic, soil and geological mapping.
- Reach delineation (presented in [Section 2.4.7.1: Watercourse Overview and Reach Delineation](#)) based on existing geomorphic mapping from the SABE (Peel 2022);
- Review of historic and recent aerial imagery, particularly with respect to deriving stream corridor dynamics;
- Site reconnaissance, including Rapid Geomorphic Assessments (RGAs; MOE 2003), Rapid

Stream Assessment Techniques (RSATs; Galli 1996), and stream classification using the Downs (1995) method;

- Meander belt width assessments for higher order streams (presented in [Section 4.1: Meander Belt Delineation](#)) and,
- Delineation of regulated habitat limits for Redside Dace (presented in [Section 2.5.5: Species at Risk Requirements](#)), following Ontario Regulation 832/21 of the Endangered Species Act.

Climate and geology play an important role in influencing the form and processes of the watercourse. Climatic fluctuations influence water balance and vegetation patterns, which impact flow regimes and the production, supply, and transport of sediment. Geological influences on patterns and rates of river change include landscape configuration, material availability, and erodibility of the substrate.

The Subject Lands are situated within the South Slope physiographic region (Chapman & Putnam 2007). This is a sloping plain that extends from the boundary with the Oak Ridges Moraine, southwards, and is underlain by glacial till. The soil types in this physiographic region are predominantly clay with some clay loam, and loam. The topography is relatively smooth, and infiltration is low due to the clay content. As a result, runoff rates are high. Surficial geology consists of clay to silt-textured till. Within the channel corridor, the surficial materials consist of modern alluvial deposits (OGS 2010).

Precipitation was calculated from climate normals (1981-2010) recorded at the Albion Field Centre (Environment Canada Climate ID 6150103), approximately 11 km northeast of the Subject Lands. Precipitation averaged 63 mm in the winter (November to February, inclusive) and 78 mm in summer (June to August, inclusive; Environment Canada 2026). For most streams in Southern Ontario, the highest instream flows typically occur during the spring freshet due to snowmelt, as well as rain-on-snow events. Convective thunderstorms are likely to be the cause of higher amounts of precipitation in the summer. Typically, these events do not result in extreme flow events, unless when sustained intense rainstorms occur.

3.1 Historical Assessment

Historical aerial photographs of the watercourse in the vicinity of the Study Area were reviewed, to determine changes to the channel and surrounding land use and land cover. Historic analyses provide insight into how past channel adjustments and modifications have contributed to current channel form and processes.

Aerial photographs from 1960, 1976, and 1988, obtained from the National Air Photo Library, were compared with open-source imagery from 1954 provided by the University of Toronto, and digital imagery from 2002, 2013, and 2024, obtained from First Base Solutions. A historical record showing the imagery can be found in **Appendix A.2.3**.

In 1954, land use predominantly consisted of agricultural use, interspersed with small residential dwellings. The Subject Lands consist of several agricultural fields, farm laneways, and several farm structures. A large, highly sinuous reach of the West Humber River traverses a small, southern portion of the Subject Lands, while smaller, straight features with small riparian buffers bisect the site, flowing from northwest to southeast. Smaller, lesser defined features drain the Subject Lands and flow a short distance before entering the West Humber River valley.

By 1960, no notable changes to the features within the Subject Lands were observed. A large meander in the West Humber River to the south of the Subject Lands avulsed during this time period, creating an oxbow lake.

By 1976, a small pond had formed to the north of Healey Road, feeding the southwestern straightened channel feature via a culvert. In turn, the feature appears to have become slightly more defined, shifting from a relatively saturated flow path to a more defined channel. Some new residential dwellings were constructed in the vicinity of the Subject Lands during this time period.

Between 1976 and 1988, an area in the northeast corner of the Subject Lands, previously an agricultural field, had been developed to contain 3 detached homes. While appearing less defined due to imagery quality, the drainage features traversing the Subject Lands likely remained

unchanged.

By 2002, the farming operations within the Subject Lands had expanded, with several new structures and laneway constructed during this time. Several crossing locations appear to have formed in the small and straight channel features traversing the property due to regular use.

Between 2002 and 2013, any riparian corridor previously existing adjacent to the straight features had been removed, likely as a part of agricultural operations. Apart from this difference, no other notable changes were observed during this time.

By 2024, a thin strip of undisturbed vegetation had reestablished adjacent to the straight features. The farmhouse and any other related structures had been demolished completely, leaving a small patch of rubble in the centre of the Subject Lands. The small pond to the north of the Subject Lands appears to have decreased in size.

3.2 Field Investigations

Field investigations were completed for the reaches of the West Humber River on December 4th, 2024, August 22nd, 2025, January 9, 2026, and consisted of feature staking, Rapid Geomorphic Assessment (RGA), a modified Rapid Stream Assessment Technique (RSAT), and classification of the reach using the Downs method. Determining whether to classify a feature as a watercourse is typically done via the watercourse definition outlined in O. Reg. 41/24 (Prohibited Activities, Exemptions and Permits) under the Conservation Authorities Act, which defines a watercourse as “a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs”.

The RGA (MOE, 2003) documents observed indicators of channel instability. Observations made during the field investigation are quantified using an index that identifies channel sensitivity based on evidence of aggradation, degradation, channel widening, and planform adjustment. The index produces values that indicate whether the channel is stable/in-regime (RGA Index score <0.20), stressed/transitional (score 0.21 - 0.40), or adjusting (score >0.41).

The RSAT (Galli, 1996) provides an assessment of the channel by also considering the ecological function of the stream. Observations under the modified RSAT include channel stability, channel scouring/ sediment deposition, physical instream habitat, water quality, and riparian habitat condition. The RSAT scores rank the channel as maintaining a poor (<13), fair (13-24), good (25-34), or excellent (35-42) degree of stream health.

The Downs method, as outlined in Thorne et al. (1997), was developed based on adjustment processes and trends of channel change and links these processes and trends to the fluvial and sediment processes responsible for channel change. This system classifies streams as stable, depositional, laterally migrating, enlarging, compound, recovering, or undercutting.

Reach WHT2(2)

Reach WHT2(2) is part of the main branch of the West Humber River, and flows from west to east across the southern region of the Subject Lands. The watercourse is situated in a confined valley, with valley toe channel contacts observed downstream of the Subject Lands via aerial imagery. The riparian buffer extends beyond 5 channel widths on either side of the feature, and is vegetated with shrubs, grasses, and other herbaceous plant species. Surrounding land use consists of agricultural farms, small residential dwellings, and open meadows. The upstream stretch, near The Gore Road, was observed to be straight, becoming highly sinuous further downstream. The channel itself was moderately entrenched, with moderately steep bank angles ranging between 30 – 60 degrees. Some instances of mass failure were observed, with vegetated clumps of earth having established in the channel.

Distinct pools and riffles could be discerned. Bankfull widths averaged between 8.5 – 9.5 m. Observed bank materials consist of clay, silt and sand. Riffle substrate consists of sand and gravel, while pool substrate is composed of clay, silt, and sand.

The RGA score of 0.21 for this reach indicated that the reach is ‘in- transition/stressed’. Widening is the most dominant geomorphic process. The RSAT score of 28 indicates that this reach is in a ‘good’ state of ecological health, with riparian habitat as the limiting factor due to the absence of

mature canopy cover throughout the reach. The Down's method classified this reach as 'M' - lateral migration, which is characterized by erosion of outer meander bends.

Reach WHT1(6)4-1

Reach WHT1(6)4-1, the eastern of the two smaller features entering the Subject Lands under Healey Road, begins on the downstream end of Healey Road. The watercourse is situated in an unconfined valley setting and is intermittently defined. A medium-sized scour pool is noted directly downstream of the culvert outfall, which was observed to be perched. The riparian buffer is slim, with active agricultural operations occurring a few metres away from the edge of the channel. Surrounding land use consists of agricultural farms, small residential dwellings, and open meadows. The channel itself presents a low degree of entrenchment, with shallow bank angles ranging between 0 – 30 degrees.

Some pools were evident, but the predominant habitat type present throughout the reach is runs. Bankfull widths average between 1.2 – 2.0 m. Observed bank materials consist of clay, silt and sand. Riffle substrate consists of sand with some gravel, while pool substrate is composed of clay, silt, and sand.

The RGA score of 0.14 for this reach indicated that the reach is 'in-regime. The RSAT score of 21 indicated that this reach is in a 'fair' state of ecological health, with riparian habitat as the limiting factor due to the absence of a significant riparian buffer along the reach. The Down's method classified this reach as 'e' - enlarging, which is characterized by downcutting.

4.0 Natural Hazards

4.1 Meander Belt Delineation

Streams and rivers are dynamic features on the landscape, and their configuration and position on the floodplain changes as part of meander evolution, development and migration processes. When development or other activities are contemplated near a watercourse, it is desirable to designate a corridor that is intended to contain all the natural meander and migration tendencies of the channel.

The space that a meandering watercourse occupies on its floodplain, and in which all these natural processes occur, is referred to as the meander belt (TRCA 2004). In the case of unconfined systems, the erosion hazard allowance consists of the meander belt and an access allowance.

In a condition where the watercourse has been historically straightened and / or does not flow through a natural meandering planform, as is the case for the straightened feature traversing the Subject Lands, WHT1(6)4-1, empirical approximations may be used to delineate the meander belt. Once the average bankfull width is determined, a hypothetical meander belt for the proposed channel can be established. A suite of empirical relationships relating bankfull width (W_b) and meander belt width (B_w) were used, including those outlined by Williams (1986 – equation 1), Ward et al. (2002 – equation 2), Lorenz et al. (1985 – equation 3), and a linear model presented by Howett (2017 – equation 4).

$$B_w = 1.2 \times (4.3 \times W_b^{1.12} + W_b) \quad [\text{Eq. 1}]$$

$$B_w = 6 \times W_b^{1.12} \quad [\text{Eq. 2}]$$

$$B_w = 7.53 \times W_b^{1.01} \quad [\text{Eq. 3}]$$

$$B_w = 6.89 \times W_b \quad [\text{Eq. 4}]$$

As WHT1(6)4-1 is believed to have been historically altered as a result of agricultural plowing or crossing, an empirical analysis was deemed appropriate. **Table 4-1**, below, provides a breakdown of the meander belt widths calculated for each method.

Table 4-1. Empirical Meander Belt Delineation Results

Method	WHT1(6)3-1
Williams (1986)	21.8 m
Ward et. al. (2002)	27.3 m
Lorenz et al. (1985)	26.4 m
Howett (2017)	24.2 m
Average	24.9 m

As such, a meander belt with a width of 13 m was delineated for WHT1(6)4-1. As discussed previously in Redside Dace occupied habitat limits of 130 m were delineated for WHT2(2) (presented in Section 2.5.5: Species at Risk Requirements). All limits are shown in **Figure 9, Appendix A.2.1.**

4.2 Toe Erosion Allowance

In the case of confined systems, the erosion hazard allowance consists of the stable slope allowance and toe erosion allowance, in addition to the access allowance. The toe erosion allowance is a horizontal distance typically measured out from the bankfull width of a watercourse, existing water level of the watercourse, or bottom of the watercourse channel, as deemed appropriate based on site-specific conditions. The allowance accounts for potential lateral channel migration and erosion at the toe of slope over the long term, and serves as a basis for the long-term stable top of slope offset.

In accordance with the *Technical Guide: Erosion Hazard Limit* MNR (2002), for systems where the valley wall is located less than 15 metres away from the watercourse, the stable slope allowance is applied from the toe erosion allowance. Conversely, for systems where the valley wall is located more than 15 metres away from the watercourse, the stable slope allowance is applied from the toe of slope. The toe erosion allowance is based on considerations such as: proximity of the watercourse to the slope toe, the presence of existing erosion, average and peak velocity within the watercourse, susceptibility of the soils at the slope toe, extent of vegetation, fluvial geomorphological processes, etc.

The main West Humber River branch flowing adjacent to the southern property boundary of the Subject Lands, WHT2(2), is situated in a confined valley setting. The northern valley slope abuts the Subject Lands, and, as such, requires a slope stability study. During the field assessments, soils along the valley of WHT2(2) were observed to consist of cohesive material containing sands and silt. Additionally, bank erosion was observed throughout the reach. Based on soil and bank erosion conditions throughout the reach, a toe erosion allowance of 15 m was adopted. However, for the majority of the reach, the valley wall was located greater than 15 m away from the watercourse.

The extent of the toe erosion allowance is shown on **Figure A.2.1, Appendix A.2.1.**

Additionally, a Long Term Stable Top of Slope (LTSTOS) study will be complete by Soil Engineers Ltd. The LTSTOS will incorporate the toe erosion setback, established by the fluvial geomorphological assessment, and a stable slope gradient. Furthermore, a regulatory allowance by the Toronto Region Conservation Authority (TRCA) will need to be applied from the LTSTOS to establish the erosion hazard limits associated with the valley slope. The slope stability assessment report is to be included in **Appendix A.3.1.**

4.3 Erosion Analysis

As current weather conditions had not permitted for a fulsome detailed survey of the features within the Subject Lands prior to completion of this report, a detailed geomorphic assessment will be performed once the spring melt occurs. Results and discussion will be included in a resubmission of this LSS. In addition to a detailed geomorphic assessment, the erosion analysis will include determining erosion thresholds, performing an erosion sensitivity analysis for downstream receiving features, and performing an erosion exceedance analysis for features deemed sensitive.

A detailed geomorphic assessment will be completed for each downstream receiving reach, based on the locations of the proposed stormwater management ponds. The detailed assessment will collect stream characteristics, such as a longitudinal profile, cross sections, bed and bank substrate characteristics, riparian conditions, and flow characteristics on the day of the assessment, to calibrate the erosion threshold model. The erosion threshold represents a discharge at which sediment within the reach is entrained. This is determined by using different methods that rely on channel and sediment characteristics.

The erosion sensitivity analysis, in accordance with the TRCA (2012) stormwater management guidelines, includes a review of historical imagery and results from field assessments. Additionally, context surrounding the total development area compared to the overall catchment area of the feature in question will be considered. Reaches situated relatively high in the watershed,

where the proposed development footprint represents a substantial proportion of the total contributing area, would be identified as sensitive due to their heightened susceptibility to hydrologic and sediment regime alterations resulting from even minor changes in runoff or drainage patterns. Conversely, reaches located lower in the watershed, where the proposed development area comprises only a small fraction of the total upstream drainage area, would be considered less sensitive, as the magnitude of potential flow and sediment delivery changes attributable to the development would be attenuated by the larger contributing catchment.

An erosion exceedance analysis will be completed for the reaches deemed sensitive and situated downstream of the proposed stormwater management. The analysis will rely on the results of the continuous hydrological model based on the proposed stormwater management strategy. Based on the previously determined erosion threshold, the hydrograph flows will be input through a representative cross section for the downstream receiving watercourse to calculate the cumulative exceedances of different hydraulic parameters. The pre- to post-development exceedance will be compared using the following criteria:

- Cumulative time of exceedance;
- Cumulative effective velocity;
- Cumulative effective discharge; and
- Cumulative effective work.

A match is considered when exceedances in the pre- and post-development conditions are within 5 - 10% of each other.

5.0 Groundwater

5.1 Hydrogeological Assessment

As a part of the Phase 1 investigation, the following assessments have been completed, and the results are presented in the report titled “*Hydrogeological Assessment for Proposed Residential*

Development, 12879 The Gore Road, Town of Caledon”, Reference Number: 2405-W038, Rev.1, dated March 3, 2026, prepared by Soil Engineers Ltd. The following summary presents the findings of the aforementioned hydrogeological assessment.

Alcan Holdings Inc. retained Soil Engineers Ltd. (SEL) to conduct a hydrogeological assessment for the property located at 12879 The Gore Road in the Town of Caledon, Ontario (the Subject Site).

The Subject Site is located at the southeast corner of Gore Road and Healey Road. The Subject Site is surrounded by Healy Road and the Gore Road to the north and west, respectively, agricultural fields and rural residential properties to the east, and agricultural and vacant lands to the south.

Based on a Preliminary Lotting Concept Plan dated January 30, 2026, by KLM Planning Partners, the proposed development will consist of a low-density residential area and an urban corridor, channel block, new roadways, municipal services and a reserved park block and a stormwater management pond block.

The current investigation revealed that:

- The subsoil investigation has revealed that beneath the topsoil veneer, the Subject Site mainly comprises silty clay till with a localized silt deposit in the lower stratigraphy at deeper depth. The silty clay deposits were also encountered above or beneath the silty clay till in the eastern portion of the Subject Site.
- The lowest and highest stabilized shallow groundwater levels were measured at El. 232.6 masl and 246.7 masl at BH/MW 102 and BH/MW 1, respectively. The interpreted shallow groundwater flow direction is mainly towards the southeast/east.
- The geomean of in-situ hydraulic conductivity for silty clay till estimated in BH/MW 1, 2, 3, 4 and 5 is 1.4×10^{-8} m/s, and it is 3.4×10^{-8} m/s for silty clay till that was measured in BH/MW 7.
- A review of groundwater quality test results for the unfiltered groundwater sample collected from monitoring well (BH/MW 1) indicates that the concentration of total manganese and total zinc exceeded the Region of Peel Storm Sewer Use By-Law parameters, but met the Sanitary Sewer Use By-Law parameters. The results suggest that any construction dewatering or foundation drainage effluents should be acceptable for discharge to the Region of Peel sanitary sewer without any pretreatment system needed. The anticipated effluents would not be acceptable for discharge

to the Region of Peel storm sewer system. However, implementing pre-treatment to lower total manganese and total zinc to meet the Region of Peel Storm Sewer Use By-Law may permit its discharge to the Region of Peel Storm Sewer system.

- The estimated preliminary maximum short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed installation of the underground services, reaches up to 7,850.0 L/day, considering an open and active excavation trench with dimensions of 2 m width and 50 m length. As such, filing an EASR with the MECP is not required for the excavation and construction of the proposed underground services if the excavation and installation of the underground services are completed over phases. Furthermore, the estimated flow rates consider the seasonally high shallow groundwater table. As such, if excavation and construction are completed during dry seasons of a year, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system
- The estimated preliminary maximum short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed townhouse blocks, reaches up to 29,600.0 L/day. As such, filing an EASR with the MECP is not required for the proposed residential lot and block. However, the estimated flow rates are considering the seasonally high shallow groundwater table. As such, if excavation and construction is completed during dry seasons of a year and over phases, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system
- The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed SWM Ponds, reached up to 475,650.0 L/day. As such, filing an EASR with the MECP is required for the construction of the SWM Pond. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system
- The maximum estimated preliminary long-term foundation drainage flow rate of 3,400.0 L/day is below the MECP PTTW threshold limit of 379,000.0 L/day for the proposed development. As such,

applying for PTTW with MECP is not required. However, obtaining a discharge agreement from the Region of Peel is required if the foundation drainage is proposed to be conveyed to the Region's sewer system.

- The concentration of total manganese and total zinc exceeded the Region of Peel Storm Sewer Use By-Law parameters, but met the Sanitary Sewer Use By-Law parameters. The results suggest that any construction dewatering or foundation drainage effluents should be acceptable for discharge to the Region of Peel sanitary sewer without any pretreatment system needed. The anticipated effluents would not be acceptable for discharge to the Region of Peel storm sewer system. However, implementing pre-treatment to lower total manganese and total zinc to meet the Region of Peel Storm Sewer Use By-Law may permit its discharge to the Region of Peel storm sewer system. The final design for any temporary or long-term construction dewatering effluent pre-treatment system is the responsibility of the contractors responsible for construction, or the water treatment system design specialists, if required.
- The maximum anticipated conceptual Zone of Influence (ZOI) for dewatering extends up to 5.6 meters from the dewatering area for the installation of underground services within the eastern portion of the Subject Site. For the construction of the proposed residential lots and townhouse blocks, the ZOI reaches up to 3.9 meters from the dewatering area. For the construction of the proposed Stormwater management pond, the ZOI reaches up to 2.6 meters from the dewatering area. A review of the records indicates that there are no structures or roads located within the Conceptual Zone of Influence from the dewatering area of the installation of the proposed underground services, the storm water management pond, the construction of the proposed house lots and townhouse blocks. Therefore, no risk is anticipated for the ground settlement. However, the recommendation on the ground settlement and conceptual zone of influence for dewatering needs to be assessed once the detailed design becomes available for review. Based on the review of the provided plan, it is understood that the tributary located in the northern portion, identified as WHT1(6)4-1, is proposed to be realigned into the proposed channel block. Therefore, no impacts are anticipated for the northern tributary of the West Humber River. Based on the review of the plan, it is understood that the existing tributaries located in the central portion, identified as WHT1(6)3-1(a), WHT1(6)3-1(b) and the southern portions identified as WHT2(2)1-1a of the Subject Site are proposed to be removed with function replicated as per Figure 12 Natural heritage

Feature Alteration dated February 25, 2026 prepared by GEI Consultants during the development. It is important to note that the creeks are located within the TRCA-regulated area. Therefore, permission may be required for the decommissioning of the existing creeks on the Subject Site. The watercourse identified as WHT2(2) is located within the proposed NHS area block. Therefore no impacts are anticipated to the watercourse.

- A review of the MECP well records indicates that there are no records for water supply wells that are registered within the Subject Site boundary and the conceptual ZoI for dewatering. Considering the current available data, significant impacts to water supply wells are not anticipated for the proposed development. However, potential risk should be assessed when further details and plans become available for review.

5.2 Water Balance and Groundwater Recharge

Additionally, as outlined in the Local Subwatershed Study (LSS) Terms of Reference dated July 2025, a site-wide pre- and post-development water balance assessment is required. Soil Engineers Ltd. has proposed the corresponding scope of work to undertake this assessment as part of the current study.

5.3 Water Supply Wells

The desktop assessment of existing water supply wells, conducted to identify groundwater use within the study area, has been completed as part of the Phase 1 investigation. This assessment involved reviewing the MECP Water Well Records database to identify potential nearby groundwater users. The findings of this review, along with the associated analyses, are presented in the report titled “Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon”, Reference Number: 2405-W038, Rev.1, dated March 2, 2026, prepared by Soil Engineers Ltd. The following summary presents the findings of the aforementioned hydrogeological assessment.

Additionally, as outlined in the Local Subwatershed Study (LSS) Terms of Reference dated July 2025, a door-to-door private well survey is to be completed for all residences located within 500 m of the Subject Site. Soil Engineers Ltd. has proposed the corresponding scope of work to

undertake this assessment as part of the current study.

5.4 Monitoring

As mentioned, the report titled “Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon”, Reference Number: 2405-W038, Rev.1, dated March 2, 2026, prepared by Soil Engineers Ltd. The Seven (7) previously installed monitoring wells were utilized to measure and monitor groundwater levels. Monitoring wells were developed on June 28, 2024, and the groundwater monitoring program confirmed the stabilized groundwater level beneath the Subject Site.

The stabilized groundwater levels were manually measured over eighteen (18) monitoring events from June 28, 2024, to February 12, 2026, with the results presented in Section 7.1 of the hydrogeological assessment report dated March 2, 2026. Additionally, a groundwater monitoring program was conducted over three (3) monitoring events between January 22, 2026 and February 12, 2026, in the newly installed monitoring wells within the footprint of the proposed stormwater management pond at the Subject Site and the findings are presented in the hydrogeological assessment report dated March 2, 2026.

The groundwater monitoring program is still ongoing, and the findings will be presented in the updated hydrogeological assessment report.

6.0 Surface Water

6.1 Hydrologic Assessment

6.1.1 Existing Setting

The site was A topographic survey was carried out by R-PE Surveying Ltd. on June 12, 2024. The investigation also included a survey of existing culverts. The locations and sizes of existing culverts at the location of the site is provided within the topographic map of the site area, presented in **Appendix A.6**.

The existing site topography is relatively flat with land sloping to the southeast and to the west. The site directs flows to the west towards the Gore Road Tributary, and southwest towards the West Humber River. An existing natural channel located to the northeast of the site drains to the Gore Road Tributary. The site is comprised of primarily agricultural lands.

6.1.2 Stormwater Management Criteria

As per the Town of Caledon's Design Criteria and the Toronto and Region Conservation Authority's Stormwater Management Criteria, the following guidelines will be used in the design of the site's stormwater management system:

Major and Minor System

- Storm sewers shall be designed to convey the 10-year return frequency storm without any surcharges;
- The Storm sewers shall be designed as per the Town of Caledon's IDF curve rainfall intensities with a minimum time of concentration of 10 minutes;
- The minimum pipe diameter for storm sewers is 300mmØ;
- Maximum full-bore velocity shall not be greater than 4 m/s, and minimum velocity shall not be less than 0.75 m/s.
- The major system shall be designed to convey the 100-year storm event;
- The maximum flow depth shall be the lesser of 10 cm above the crown of the road or the water level up to the ROW.
- Runoff coefficients shall be determined based on land use as follows:
 - Parks & Open Space 0.25
 - Single Family Residential 0.65
 - Semi-detached Residential 0.65
 - Townhouse or Rowhouse 0.75
 - Roadways 0.90

Quantity Control:

- Per the Town of Caledon and TRCA Stormwater Design Guidelines, quantity control is to be provided for the 2-to-100-year design storms to the appropriate Watershed Flood Control Criteria required by the Toronto and Region Conservation Authority (TRCA). Peak target flows are determined using the Humber River Sub-Basin 36 Equations summarized in **Table 5-1**.

Table 6-1 Humber River Unit Flow Equations

Return Period	Sub-Basin 36 Equations
2 Year	$Q=3.142-0.233*\ln(A)$
5 Year	$Q=5.557-0.427*\ln(A)$
10 Year	$Q=7.443-0.578*\ln(A)$
25 Year	$Q=9.838-0.757*\ln(A)$
50 Year	$Q=11.920-0.921*\ln(A)$
100 Year	$Q=14.140-1.096*\ln(A)$

- Design Storms: Four storm distributions were examined to analyze the volume of runoff to be controlled. The 6-Hour AES and the 12-Hour AES as provided by the TRCA, the 4-Hour Chicago storm created with the Town of Caledon IDF curve, and the regional storm.
 - Regional storm quantity control will be managed by the SWM Pond. The target peak flow for the regional storm is based on the pre-development regional storm flow.

Quality Control

- Per the Town of Caledon and TRCA stormwater design criteria, quality control shall provide Level 1 Enhanced treatment through the long-term removal of 80% Total Suspended Solids (TSS) controlling the 90th percentile runoff event.

Erosion Control

- Per the Town of Caledon and TRCA stormwater design criteria, erosion control is to be provided via detention of the 25 mm-48 hr event.

Water Balance

- Requirement to meet pre-development water balance to the greatest extent feasible. Per the Source Protection Information Atlas (MECP) the site is not in a wellhead protection area (WHPA).

CLI-ECA Requirements

- Developments within the Town are required to comply with CLI-ECA requirements. The CLI ECA mandates controlling at least 27mm through retention methods (such as infiltration and reuse) as much as possible, followed by filtration for the remaining amount. Conventional water quality control measures are permitted only after maximizing retention and filtration.

6.1.3 Existing Flows

The hydrologic assessment is performed by first acquiring existing TRCA VO hydrology models. The hydrology model is established in Visual OTTHYMO 6.2 (VO) software. For the hydrological assessment work, two models were acquired from the TRCA, prepared by Civica Infrastructure Inc., named as:

1. Humber – Large Storms – no ponds (2017) – this VO model is used as the basis for the regional storm assessment, using CNIII values. This model represents the future, uncontrolled conditions. Within this model, a scenario for the 350- and 500-year storms using CNII is available. This scenario has been used to model the 100-year storm scenarios as it represents future uncontrolled conditions.
2. Design Storm Scenarios (2015) – this VO model is used as the basis for assessments of

storms of with 2- up to 50-year return periods. This model uses existing, controlled conditions.

At present, the TRCA is unable to provide a hydrology model for the future, uncontrolled conditions for the 100-year storm as this model is under development. Thus, the *Large Storms* model for the 350– to 500-year storms has been used to model the 100-year storm. The *Large Storms* model is established with future land use conditions and uncontrolled flows, making it appropriate for use to delineate flood lines.

The *Downstream Analysis Report* by Schaeffers Consulting Engineers currently being drafted details the hydrological assessment (2025) and catchment discretization applied for this analysis (to be attached as **Appendix A.5.1**). The report will summarize the flow assessment and key hydrological nodes of the study. After adjustments to the TRCA VO model based on corrected catchment delineation, existing conditions peak flows were determined at downstream nodes. **Table 6-2** summarizes the existing conditions regional peak storm event flows at key downstream nodes from the Subject Lands area.

Table 6-2: Regional Storm Existing Downstream Peak Flows

River and Reach	Areal Reduction Factor	VO Element	Existing Peak Flow (m ³ /s)
West Humber Reach 5B	99.2	729	145.63
West Humber Reach 5A	95.4	7607	168.20
West Humber Reach 4	94.8	7603	228.54
Gore Road Trib A Reach 1	100	614	13.40
Gore Road Trib Reach 1	99.2	1393	39.75

Release rate flows for the stormwater management design have been established as described by the *Functional Serving and Stormwater Management Report* by Schaeffers Consulting Engineers (2025) (**Appendix A.5.2**). **Table 6-3** summarizes the SWM Pond allowable release rates.

Table 6-3: SWM Pond Allowable Release Rates Summary

Return Period	Unit Flow (L/s/ha)	Release Rate (m³/s)
2 Year	7.69	0.097
5 Year	11.78	0.148
10 Year	14.48	0.182
25 Year	18.23	0.229
50 Year	21.30	0.267
100 Year	24.05	0.302
Regional*	-	1.714

* Based on the pre-development regional storm flow

6.2 Wetland Water Balance Risk Evaluation

A wetland (MAM2-2) is located outside the southeast corner of the subject site with its contributing drainage area partially within the subject site (**Figure 6 Appendix A.1.1**). Based on the hydrological assessment, the hydrologic change resulting from the proposed development is considered significant, and the wetland has been classified as High Risk in accordance with the Toronto and Region Conservation Authority (TRCA) Wetland Water Balance Risk Evaluation Guidelines (November 2017). See **Appendix A.5.3** for the WWBRE. Potential impacts associated with this risk assessment are further detailed in Section 7.3.1.2.

In accordance with TRCA guidelines, continuous hydrologic modelling is required where a wetland is classified as “High” or “Medium” Risk. Based on the Wetland Risk Evaluation, MAM2-2 requires continuous modelling, which will be completed as part of the subsequent design stage.

For the purpose of this report, a Feature-Based Water Balance (FBWB) assessment has been completed using the Area × Runoff Coefficient (A×C) comparison method to demonstrate that maintaining the wetland water balance is feasible under the proposed development. The FSSR in **Appendix A.5.2** provides additional details on the assessment with supporting figures.

Runoff from the external drainage area to the north (based on annual average rainfall) will be conveyed through the site via the Clean Water Collector (CWC) system to maintain baseflow contributions. Major system flows will bypass the wetland and discharge to the proposed realigned channel within the site. In addition, clean roof runoff from selected residential units will be directed to the CWC system to supplement baseflow contributions to the wetland. The A×C comparison presented in **Table 6-4** summarizes the change in runoff contribution to the wetland under pre- and post-development conditions.

Table 6-4: Wetland Area x Runoff Coefficient Pre vs. Post development comparison

Wetland ID No.	Pre-development			Post-development			Comparison (%)
	Total Contributing Area (ha)	Runoff Coefficient C	A x C	Total Contributing Area (ha)	Runoff Coefficient C	A x C	
MAM2-2	16.68	0.25	4.17	6.35 + 1.92	0.25	2.07	0%
				2.30*	0.9	2.07	

*Post-Development Roof Area directly connected to the CWC, draining to Wetland MAM2-2

The results indicate that the post-development runoff volume directed to the wetland is maintained at levels comparable to pre-development conditions, thereby meeting the intent of TRCA’s feature-based water balance criteria. This approach provides a practical and feasible measure to maintain the overall water balance the wetland. Confirmation and refinement will be completed through continuous hydrologic modelling at the detailed design stage.

6.3 Surface Water Monitoring

Surface water monitoring will be completed in 2026. A summary and analysis of these results will be provided as part of a resubmission.

6.4 Municipal Servicing

6.4.1 Water Supply Infrastructure

Peel Region completed its 2020 Water & Wastewater Master Plan as an update to the 2013 Master Plan to support the expected population growth in the region to 2041. According to Volume 3 of the 2020 Master Plan, the subject site is located within Pressure Zone 6, which has serviceable elevations ranging from 214.5m to 259.1m. The Top Water Level in this zone is 297.2m, resulting in a hydraulic grade line of 304.8m. The following existing water supply infrastructure is located adjacent to the subject site.

- 200mmØ watermain on Healey Road
- 200mmØ watermain on The Gore Road
- 600mmØ watermain on The Gore Road, between Mayfield Road and Highway 413

Currently, Peel Region is in the process of updating its master plan study to accommodate growth up to 2051, which is anticipated to be completed in 2026. As per Region of Peel's Water Development Charges 2025, following water supply infrastructure is expected to be within the vicinity of the subject site at the time of construction:

- 400mmØ watermain on Healey Road (Anticipated Construction Year - 2027)
- 600mmØ watermain on The Gore Road, between Highway 413 and Healey Road (Anticipated Construction Year - 2027)
- 900mmØ transmission main on Healey Rd

Please note, the future watermains along The Gore Road and Healey Road are currently in the 30% Design Phase. It is our understanding that these watermains will be in operation by the year 2027. Further coordination with Peel Region will be needed to provide the latest timeline updates for these projects. Refer to Section 3.0 of the *Functional Servicing and Stormwater Management Report* by Schaeffers Consulting Engineers (2025) for additional servicing demand details (**Appendix A.5.2**).

6.4.2 Sanitary Infrastructure

Peel Region completed its 2020 Water & Wastewater Master Plan as an update to the 2013 Master Plan to support the expected population growth in the region to 2041. According to Volume 4 of the 2020 Master Plan the subject property is located outside the Region of Peel, McVean Sewershed and there is no existing wastewater infrastructure in the vicinity of the subject site.

Currently, Peel Region is in the process of updating its master plan study to accommodate growth up to 2051, which is anticipated to be completed in 2026. As per Region of Peel's Wastewater Development Charges 2025, following wastewater infrastructure is expected to be within the vicinity of the subject site at the time of construction:

- 525 mm PVC sanitary sewer on Healey Rd, running east towards Humber Station Rd. (Construction Year - 2026)
- 375 mm PVC sanitary sewer south of subject site, running east towards Humber Station Rd. (Construction Year - 2026)
- 750 mm PVC sanitary sewer on The Gore Rd. (Construction Year - 2035)

Refer to Section 4.0 of the *Functional Serving and Stormwater Management Report* by Schaeffers Consulting Engineers (2025) for additional details of the Sanitary Serving Plan (**Appendix A.5.2**).

Phase 2 – Impact Assessment

Phase 2 provides a detailed characterization of the existing conditions, building off the outputs from Phase 1. The output from Phase 2 is an integrated and iterative impact assessment for all disciplines.

Phase 2 introduces the land use plan and includes a fulsome assessment of potential impacts on natural heritage and water resource features and functions as a result of proposed development. This report also includes an exploration of mitigation and management strategies for the proposed impacts.

Where appropriate, analytical tools are used to predict changes to existing conditions and assess potential land use scenarios in relation to subwatershed-based targets based on background data or baseline monitoring data collected during Phase 1. These impact analyses aim to identify preferred land use scenarios that meet the goals and targets identified within the SABE SWS and in Phase 1.

7.0 Natural Heritage

7.1 Scope Overview

The purpose of this Phase 2 natural heritage study is to evaluate the potential impacts of the proposed development on the natural heritage features and ecological functions of the NH Study Area as well as outline proposed mitigation, enhancement and compensation measures (as may be necessary).

Phase 1 established the Existing NHS, shown in **Figure 10 (Appendix A.1.1)**. In Phase 2, the NHS is further refined to develop the Proposed NHS, taking into consideration ecological restoration, enhancement, and long-term management opportunities (e.g., watercourse realignment). The Phase 2 assessment integrates findings from Phase 1 and informs stormwater management and hydrogeological assessments to support subwatershed-based targets. It includes a high-level evaluation of potential direct, indirect, and induced impacts; identification of areas of alteration and removal; development of mitigation and management strategies; coordination with other

disciplines to support water balance and restoration design; and review of opportunities for compensation, enhancement, and policy alignment.

Key components of this Phase 2 study include:

- Analysis of potential direct and indirect impacts of the proposed development on the natural heritage features, ecological functions, and species known to be present within the NH Study Area;
- Recommendations for mitigation measures to avoid or minimize impacts during and after development;
- Overview of proposed restoration and enhancement measures; and
- Mapping of the Proposed NHS.

7.2 Natural Environment Mitigation Hierarchy

A key consideration in developing a robust NHS that meets the targets and enhancement goals outlined in Phase 1 is the Net Gain Mitigation Hierarchy (see **Section 2.2.3.5**) per Section 2.6.3.1 of the SABE Scoped SWS (Wood et al. 2022). This framework guides the protection, mitigation, and enhancement of ecological functions through a stepwise approach that prioritizes avoidance, minimizes impacts, and supports net ecological benefits. It aligns with provincial policies and best practices for sustainable development.

The hierarchy highlights the importance of long-term monitoring and adaptive management to maintain the effectiveness of mitigation and enhancement measures over time. It also incorporates climate adaptation measures to improve ecosystem resilience. Collaboration with the Town, conservation authorities, and other stakeholders is encouraged to help align outcomes with local and regional sustainability objectives.

This structured approach promotes conservation-first planning and supports offsetting unavoidable impacts through science-based restoration and enhancement. The hierarchy follows a logical

sequence: first avoiding impacts through careful land use planning and early environmental screening; then minimizing and mitigating effects where avoidance is not possible; followed by restoring degraded areas to improve ecological function. Opportunities to enhance the system by increasing ecological connectivity, resilience, or habitat quality are also considered. Where impacts cannot be fully addressed through these measures, compensation may be applied as a last resort, with the goal of achieving no net loss in terms of area or ecological function.

In applying the Natural Environment Mitigation Hierarchy to the proposed development, avoidance of natural heritage features and their functions was prioritized to the extent feasible through early site planning, environmental screening, and refinement of the development concept. The proposed layout reflects efforts to retain key natural features, establish VPZs/buffers, and direct development toward areas with lower ecological diversity and sensitivity. Given site configuration, engineering requirements, and broader land use planning objectives and targets, alternative layouts that would further reduce encroachment into the NHS were considered but would have constrained the ability to achieve these objectives and targets. Where complete avoidance was not feasible, ecological impacts were minimized through design measures and offsetting was considered where appropriate. The preferred development layout represents a balanced outcome that supports planned growth and efficient land use while maintaining and enhancing the existing NHS through mitigation, restoration, and enhancement measures.

7.3 Impact Assessment and Mitigation Measures

This section evaluates the potential impacts of the proposed development on the natural heritage features of the NH Study Area, as identified in the biophysical characterization and significance analysis in Phase 1 (see **Section 2.0**), as well as those deemed relevant based on regulatory requirements or site-specific conditions. Potential impacts are assessed for both short- and long-term effects on natural heritage features and their ecological functions. Where appropriate, measures are identified to avoid or mitigate potential negative impacts.

Ecological impacts are generally categorized into three types:

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

Figures 2-9 (Appendix A.1.1) provide a visual overview of the natural heritage constraints identified within the NH Study Area that are discussed in the following subsections. The resulting Existing NHS is shown in **Figure 10 (Appendix A.1.1)** and overlaid with the proposed Draft Plan in **Figure 11 (Appendix B.1.1)**. Potential direct and indirect impacts from the proposed construction activities are evaluated for each natural heritage feature in **Sections 8.3.1 to 8.3.7**. Potential induced impacts are discussed separately in **Section 8.3.8**.

7.3.1 Wetlands

The following wetlands were recorded within the NH Study Area:

- A complex of open water (OA) and Mineral Shallow Marsh (MAS2) / Mineral Meadow Marsh (MAM2) along the West Humber River (within the Subject Lands and adjacent 120 m);
- Three additional wetland features that were staked with TRCA on July 23, 2025. These features are small, and are associated with HDF WHT1(6)3-1 and watercourse WHT1(6)4-1 (within the Subject Lands);
- A small area of Swamp Maple Mineral Deciduous Swamp (SWD3-3) across The Gore Road (adjacent 120 m);
- A small area of Cattail Mineral Shallow Marsh (MAS2-1) across The Gore Road (adjacent

120 m); and

- An area of Reed-canary Grass Mineral Meadow Marsh (MAM2-2) immediately east of the Subject Lands (adjacent 120 m)

See **Figure 6 (Appendix A.1.1)** for the locations of observed wetlands.

7.3.1.1 Direct Impacts

The proposed Draft Plan includes removal of the three minor wetland features staked with TRCA. These features are small (totaling only 0.035 ha overall), are associated with riparian vegetation along HDF WHT1(6)3-1 and watercourse WHT1(6)4-1, and they provide limited ecological function on the landscape. The removal of these features is proposed to be compensated through the inclusion of wetlands along the realigned WHT1(6)4-1 channel in the northeast corner of the Subject Lands. The exact offsetting ratio will be confirmed when additional details on the realigned channel are available; however, a minimum of 1:1 replacement area for area removed will be targeted. The realigned channel and associated wetlands are expected to provide a net gain in ecological function compared to existing agriculturally influenced conditions through the provision of native vegetation and by providing a greater overall area of connected habitat.

The MAM2-2 that slightly encroaches into the southeast corner of the Subject Lands (but is primarily located on the adjacent property) will be retained in place and protected with a 10 m buffer during the first phase the proposed development of the Subject Lands. However, development within the adjacent Bolton West Secondary Plan area may require construction of a north-south arterial road adjacent to the Subject Lands property line, which would necessitate a crossing of the wetland. Such a crossing would be expected to remove the very small part of the wetland within the Subject Lands as well as adjacent parts of the wetland within the road right-of-way. Therefore, under this future development scenario, a 10 m buffer from the residual portion of the wetland downstream from the new arterial road would not be required and development could occur up to the property line. The wetland and 10 m buffer are shown as constraints in the Proposed NHS, but the associated area is lotted out but hatched on the concept plan, reflecting the

interim scenario and potential future development.

7.3.1.2 Potential Indirect Impacts

Hydrology

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

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

GEI, Schaeffers, and SEL have completed a Wetland Water Balance Risk Evaluation (WWBRE) for the MAM2-2 in the southeast corner of the Subject Lands and adjacent property, in accordance with the TRCA 2017 guidance document, provided in **Section 6.2**. The magnitude of potential hydrological change to the wetland subject to the WWBRE was evaluated as “high”. Sensitivity of the wetland was also evaluated as “high”. Therefore, the overall evaluation identified a “high” risk. As a result, the wetland risk evaluation decision tree indicates that monitoring is required.

A water balance analysis was prepared for the subject site to determine infiltration levels for pre- and post-development conditions. The analysis uses precipitation, evapotranspiration, infiltration, soil types, and land use to determine the water balance. Precipitation and evapotranspiration

parameters were obtained using the TRSPA Water Balance Tool. Full details of the analysis and proposed mitigation measures are provided in the *Functional Servicing and Stormwater Management Report (Appendix A.5.2)*.

The proposed mitigation will consist of a clean water collection system within the proposed residential area to direct clean water discharge at a headwall located within the 10 m buffer from the wetland.

The other small wetlands staked with TRCA along WHT1(6)3-1 and WHT1(6)4-1 are proposed for removal and replication in the realigned watercourse corridor. Accordingly, no WWBRE was required for these wetlands.

Similarly, no evaluation was necessary for the wetlands associated with the West Humber River channel.

Construction-Related Disturbances

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

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

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

7.3.1.3 Mitigation Measures

Ecological Setbacks

The establishment of setbacks from wetlands helps protect the form and function of these retained natural areas from potential development impacts during construction and over the long-term. As outlined in **Section 2.6.2.2**, a 30 m setback is required for all wetlands within the Greenbelt Plan Area (MMA 2017); this has been followed on site for the wetlands along the West Humber River channel. The three small, staked wetlands within the remainder of the Secondary Plan Area (outside of the Greenbelt Plan Area) are proposed to be removed and their function replicated within the realigned channel in the northeast corner of the Subject Lands (see **Section 8.3.1.1**). For wetlands outside of the Secondary Plan Area and Greenbelt Plan Area, a 10 m buffer (at least on a temporary basis until the adjacent arterial road is constructed) is recommended as described previously under the direct impacts section.

The existing buffer area is primarily fallow agricultural land. It is recommended that the buffer be revegetated with a native species seed mix appropriate for use in this area, combined with temporary cover cropping and/or stabilization as necessary. Restoration of the buffer is expected to assist with buffer functions to prevent negative impacts on the adjacent wetland.

Hydrology

To mitigate potential impacts to wetland hydrology and water quality for the wetlands associated with the West Humber River (which is the ultimately receiving watercourse), the proposed SWM strategy includes one SWM Pond designed to meet quantity, quality, erosion, and volume control

requirements.

Overall site-wide water balance objectives are supported through LIDs. Together, these measures are intended to preserve the hydrological function of wetlands retained within and adjacent to the Secondary Plan Area.

As noted previously, a clean water collection system has been designed to convey clean flow to maintain the MAM2-2 wetland in the southeast corner of the Subject Lands.

With these mitigative measures, no negative impacts on wetland hydrology are expected as a result of the proposed development.

Construction Management Practices

A comprehensive ESC Plan will be prepared for the proposed development, in accordance with the *Erosion and Sediment Control Guide for Urban Construction* (TRCA 2019). The ESC Plan should include both erosion and sediment control measures to minimize construction phase impacts on retained wetlands and other sensitive features. Erosion control strategies to be considered should include but not necessarily be limited to construction phasing to limit soil exposure, immediate stabilization of stockpiled topsoil, and stabilization of inactive areas using methods such as mechanical seeding, hydroseeding, growth media blankets, or Terra Seeding. Sediment control measures to be considered but necessary be limited to perimeter siltation fencing, silt socks for energy dissipation and sediment capture, sediment traps sized according to guideline specifications, and temporary sediment ponds with a minimum 48-hour drawdown time. Cut-off swales and flow distributors should also be incorporated and stabilized as per ESC guidelines. GEI recommends regular monitoring of ESC measures by a qualified inspector during construction to ensure ongoing effectiveness.

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from wetlands, at a minimum distance of 30 m. Vehicle refueling and maintenance should occur off-site or in designated areas well away from wetlands to prevent accidental spills of fuels, oils, or other hazardous materials from entering these

features. Additionally, all vehicles and equipment should arrive at the construction site clean and free of any soil or vegetation to prevent the introduction of invasive species. Before leaving the site, in line with best management practices, vehicles and equipment should be cleaned again in designated areas with appropriate containment to prevent the spread of invasive species to other areas.

Mitigation Summary

With the implementation of these mitigative and restorative measures—including wetland replication in the realigned channel, buffers, SWM strategy, and construction management practices—no negative impacts are anticipated to the retained or replicated wetlands as a result of the proposed development.

7.3.2 Woodlands

One significant woodland is located within the Secondary Plan Area (the CUW1/THDM2-6 feature within the Greenbelt Plan Area). In addition, two significant woodlands (the FOD and FOD/FOD5-1/SWD3-3 features west of The Gore Road) and one non-significant woodland (southernmost CUW1) are located within 120 m of the Secondary Plan Area (see **Figure 7, Appendix A.1.1**).

7.3.2.1 Direct Impacts

No direct impacts to significant or other woodlands are anticipated as a result of the proposed development. The Draft Plan and all development related grading respects all significant woodland boundaries and their associated setbacks (see **Figure 11, Appendix B.1.1**).

7.3.2.2 Potential Indirect Impacts

Construction-Related Disturbances

Potential indirect impacts on the significant woodland and other woodlands within the NH Study Area include construction-related disturbance and associated ecological stressors. Dust generated

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

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

7.3.2.3 Mitigation Measures

Ecological Setbacks

The establishment of setbacks from woodlands helps protect the form and function of these retained natural areas from potential development impacts. As outlined in **Section 2.6.2.2**, a 30 m setback is required within the Greenbelt Plan Area (MMA 2017) for the Significant Woodland.

The Draft Plan and associated grading plan respects all required setbacks from the Significant Woodlands (see **Figure 11, Appendix B.1.1**). The only proposed encroachment into the 30 m woodland setback is for the proposed outlet from the SWM Pond, which is expected to be constructed a minimum of approximately 8 m from the adjacent dripline from the Buckthorn Thicket woodland. The area where the outlet will be constructed currently consists of a disturbed cultural meadow along WHT2(2)1-1a. No construction related activity should occur within any identified tree protection zones for the edge trees along the woodland boundary adjacent to the SWM pond outlet.

Ecological restoration within existing fallow agricultural lands within the 30 m woodland setback is proposed and expected to result in enhancements to woodland form and function through enhanced buffering capacity and complimentary habitat.

Construction Management Practices

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from woodlands, at a minimum distance of 30 m. Vehicle refueling and maintenance should occur off-site or in designated areas well away from woodlands to prevent accidental spills of fuels, oils, or other hazardous materials from entering these features. Additionally, all vehicles and equipment should arrive at the construction site clean and free of any soil or vegetation to prevent the introduction of invasive species. Before leaving the site, in line with best management practices, vehicles and equipment should be cleaned again to prevent the spread of invasive species to other areas.

Mitigation Summary

With the implementation of these mitigation measures—including setbacks and construction management practices—no negative impacts are anticipated to the retained woodlands as a result of the proposed development.

7.3.3 Significant Valleylands

The West Humber River valleyland was identified as a significant valleyland (see **Section 2.5.1.4**, and **Figure 10, Appendix A.1.1**).

7.3.3.1 Direct Impacts

No direct impacts are anticipated to the West Humber River valleyland as a result of the proposed development. The Draft Plan and associated grading plan maintains all confirmed significant valleyland boundaries and its associated setback (**Figure 11, Appendix B.1.1**).

7.3.3.2 Potential Indirect Impacts

Construction-Related Disturbances

Construction activities pose risks to valleylands by increasing erosion and sedimentation through the exposure of bare soil during grading, excavation, and vegetation removal. Without effective ESC measures, sediment-laden runoff can potentially accelerate rates of change in planimetric form within affected valleylands. Sediment-laden runoff may also carry nutrients and pollutants into valleylands, potentially causing shifts in vegetation communities. These impacts may be particularly pronounced in areas with steep slopes or near sensitive ecological features. Dust generated by construction machinery can also settle on to vegetation and aquatic features, potentially interfering with photosynthesis and harming vegetation within the valleyland (MNR 2010).

Potential indirect impacts on the significant valleyland also include improperly secured construction waste, such as plastics and packaging, may be carried by wind into surrounding natural areas, degrading habitat quality. Additionally, soil and water contamination risks are heightened during construction due to the potential for accidental spills of fuels, oils, or other hazardous substances during equipment maintenance and refueling activities (MNR 2010).

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

7.3.3.3 Mitigation Measures

Ecological Setbacks

The establishment of setbacks from valleylands helps protect the form and function of these

retained natural areas from potential development impacts during construction and over the long-term. As outlined in **Section 2.6.2.3**, a minimum 5 m buffer has been applied from the staked top of bank. However, the majority of the top of bank is >19 m from the limit of grading associated with the adjacent SWM Pond. (see **Figure 11, Appendix B.1.1**). Revegetation of fallow agricultural lands within the proposed setback area is expected to result in enhancements. This setback is anticipated to be sufficient to protect the form and function of the valleyland.

Construction Management Practices

A comprehensive ESC Plan will be prepared for the proposed development, in accordance with the *Erosion and Sediment Control Guide for Urban Construction* (TRCA 2019). The ESC Plan should include both erosion and sediment control measures to minimize construction-phase impacts on retained wetlands and other sensitive features. Erosion control strategies to be considered should include but not necessarily be limited to construction phasing to limit soil exposure, immediate stabilization of stockpiled topsoil, and stabilization of inactive areas using methods such as mechanical seeding, hydroseeding, growth media blankets, or Terra Seeding. Sediment control measures to be considered but necessary be limited to perimeter siltation fencing, silt socks for energy dissipation and sediment capture, sediment traps sized according to guideline specifications, and temporary sediment ponds with a minimum 48-hour drawdown time. Cut-off swales and flow distributors should also be incorporated and stabilized as per ESC guidelines. GEI recommends regular monitoring of ESC measures by a qualified inspector during construction to ensure ongoing effectiveness.

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from wetlands, at a minimum distance of 30 m. Vehicle refueling and maintenance should occur off-site or in designated areas well away from wetlands to prevent accidental spills of fuels, oils, or other hazardous materials from entering these features. Additionally, all vehicles and equipment should arrive at the construction site clean and free of any soil or vegetation to prevent the introduction of invasive species. Before leaving the site, in line with best management practices, vehicles and equipment should be cleaned again in

designated areas with appropriate containment to prevent the spread of invasive species to other areas.

Mitigation Summary

With the implementation of these mitigation measures—including setbacks and construction management practices—no net negative impacts are anticipated to the West Humber River significant valleyland as a result of the proposed development.

7.3.4 Significant Wildlife Habitat

SWH identified within the Secondary Plan Area and the adjacent 120 m is as follows (**Figure 8, Appendix A.1.1**):

- Candidate Seasonal Concentration Areas:
 - Turtle Wintering Area (within the Subject Lands and adjacent 120 m)
 - Candidate Bat Maternity Colony SWH (adjacent 120 m only)
- Candidate Specialized Wildlife Habitat:
 - Bald Eagle and Osprey Habitat (adjacent 120 m only)
 - Seeps and Springs (adjacent 120 m only)
- Candidate Habitat for Species of Conservation Concern:
 - Marsh Breeding Bird Habitat (adjacent 120 m only)
 - Terrestrial Crayfish (adjacent 120 m only)
 - Eastern Wood-Pewee (adjacent 120 m only)
 - American Brook Lamprey (within the Subject Lands and adjacent 120 m)

- Upland Sandpiper (adjacent 120 m only)
- Snapping Turtle (within the Subject Lands and adjacent 120 m)

Candidate SWH within the Subject Lands consists of Turtle Wintering Area, American Brook Lamprey, and Snapping Turtle habitat, all of which are associated with the West Humber River. While the West Humber River will not be directly impacted by the proposed development (and setbacks from the associated valleyland will be maintained as discussed in **Section 8.3.3.3**), potential indirect impacts and mitigation measures for wetlands and valleylands would also apply to protect the Candidate SWH. Potential indirect impacts and mitigation measures are outlined in **Section 8.3.1** and **8.3.3**.

Candidate SWH within the adjacent 120 m is associated with various woodlands and wetlands offsite. Natural features outside of the Subject Lands will not be impacted by the proposed development; however, potential indirect impacts and recommended mitigation measures for woodlands and wetlands, as outlined in **Section 8.3.1** and **8.3.2**, would also apply to protect the Candidate SWH within 120 m of the Subject Lands.

7.3.5 Fish Habitat

Within the Secondary Plan Area, direct fish habitat was identified in the West Humber River and watercourse WHT1(6)4-1 in the northeast corner of the site and candidate direct fish habitat was identified within WHT2(2)1-1b (downstream from the Subject Lands). Indirect fish habitat was identified within HDF WHT1(6)3-1.

Within 120 m of the Secondary Plan Area, direct fish habitat has been assumed to be present in all unevaluated, mapped drainage features, except where features traverse entirely through agricultural lands and appear marginal through review of aerial imagery. Where features within 120 m of the Subject Lands are located in entirely agricultural lands and appear marginal, indirect fish habitat has been assumed. **Figure 5 (Appendix A.1.1)** depicts direct and indirect fish habitat within the NH Study Area.

7.3.5.1 Direct Impacts

Watercourses

The proposed development proposes the realignment of watercourse WHT1(6)4-1, as shown in **Figure 13 (Appendix B.1.1)**. The proposed channel realignment has incorporated fluvial geomorphic considerations, including meander belt width delineation and natural channel design, and has addressed TRCA erosion hazard setback requirements of 10 m from the top of the realigned corridor.

Watercourse WHT1(6)4-1 currently provides direct fish habitat functions; however, this feature has been degraded by agricultural activities on the Subject Lands. Realignment of WHT1(6)4-1 and incorporation of natural channel design is anticipated to result in long-term enhancements to its direct fish habitat functions. The new channel corridor will support a dynamically stable bed and banks, along with re-naturalized riparian zones due to the cessation of farming within the corridor. Anticipated ecological benefits include:

- Improved channel bed and bank stability, reducing erosion and fine sediment transport to downstream habitats;
- Increased morphological diversity, enhancing benthic invertebrate habitat and forage resources for downstream fish communities; and
- Establishment of riparian vegetation to stabilize banks, provide shade, and contribute organic material to the system.

Furthermore, the low flow channel will be longer than the existing channel.

Despite these anticipated ecological benefits, construction of the realigned channel has the potential to temporarily affect fish and fish habitat within the downstream receiving watercourse through potential erosion, sedimentation, flow disruption, or accidental spills. Mitigation measures are discussed in **Section 8.3.5.3**.

No direct impacts on WHT2(2)1-1b are expected as a result of the proposed development. The watercourse is located downstream from the Subject Lands.

Headwater Drainage Features

As discussed in **Section 2.4.7.3**, WHT1(6)3-1 was identified as a mitigation-ranked HDF (see **Figure 5, Appendix A.1.1**). It is acknowledged that TRCA considers a portion of the feature to be a regulated watercourse, but as outlined previously, in GEI's opinion the feature should be considered an HDF based on site-specific characteristics. A site visit will be planned with TRCA for spring 2026 to review this feature further following the spring freshet.

This feature provides minor, indirect fish habitat functions through the conveyance of ephemeral flows from its local drainage area to downstream (off-site) watercourses. These flows help support downstream direct and indirect fish habitat. Cessation of ephemeral flow contributions to off-site features could potentially cause negative impacts to these habitat functions. As such, WHT1(6)3-1 has been identified as a mitigation-ranked feature based on its role in conveying ephemeral off-site flows. One small wetland feature was also identified along HDF WHT1(6)3-1 near the culvert under Healey Road; however, this wetland is highly disturbed due to agricultural practices, and its indirect fish habitat functions are limited.

This HDF is proposed for removal from the Subject Lands. To mitigate potential negative impacts on the indirect fish habitat functions of the HDF, several mitigative approaches are proposed:

- Flows entering the Subject Lands at the upstream end of WHT1(6)3-1 will be captured and conveyed in a separate pipe to the upstream end of the realigned WHT1(6)4-1 channel corridor. This measure will ensure that these flows are conveyed through an increased length of dynamically stable, well-vegetated corridor (to maintain and enhance sediment transport and organic material contribution) towards the Gore Road Tributary (to maintain hydrological inputs to this fish-bearing watercourse. The realigned watercourse has been designed to accept these additional flows from the upstream end of WHT1(6)3-1.
- A clean water collection system has been identified to collect clean runoff from the

proposed subdivision and convey it to an outlet headwall in the 10 m buffer from the MAM2-2 wetland at the downstream end of WHT1(6)3-1. This measure is intended to maintain appropriate hydrology in the wetland and contribute clean flows to downstream fish habitats. It is recommended that a polishing wetland be designed at the outlet headwall to provide additional water quality and organic material contributions to the clean flow discharge.

With these measures in place, no negative impacts on fish habitat are expected as a result of the proposed management approach for WHT1(6)3-1.

The remaining HDF on site (WHT2(2)1-1a) was not observed to be flowing during any of the 2023 or 2024 field investigations. WHT2(2)1-1a is believed to have been associated with the residential area which previously existed at the top end of the feature; however, based on field data, the feature is now dry, with exception of potential flow conveyance during storm events. This feature was ranked as No Management Required per HDFA guidelines (see **Section 2.4.7.3; Figure 5, Appendix A.1.1**). Its removal is not expected to have any negative impact on fish habitat. The proposed SWM pond will convey flow to the downstream watercourse portion of WHT2(2)1-1b to maintain/enhance hydrology to support the potential direct fish habitat function of this watercourse.

7.3.5.2 Potential Indirect Impacts

Hydrology

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

natural water balance and drainage patterns that support fish habitat (MNR 2010).

Construction-Related Disturbances

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

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

7.3.5.3 Mitigation Measures

Ecological Setbacks

The establishment of setbacks from fish habitat helps to protect the form and function of these retained natural areas from potential development impacts.

As outlined in **Section 2.6.2.2**, a 30 m setback is provided from the retained West Humber River watercourse in the Greenbelt Plan Area (MMA 2017), which was identified as providing direct fish habitat. The area of the 30 m setback is already fully vegetated and site alteration is proposed within it.

The remaining two HDFs and watercourse WHT1(6)4-1 within the Subject Lands are proposed to be removed and/or realigned, as discussed in **Section 8.3.5.1**, above. The proposed realigned

channel in the northeast corner of the Subject Lands has been designed with a 10 m setback from the top of the realigned corridor, resulting in a minimum of at least 15 m from the centreline of the realigned low flow channel. All areas within the realigned corridor will be planted with a mix of native vegetation species and forms to provide riparian fish habitat functions. Given the existing and longstanding agricultural disturbance adjacent to the current watercourse channel, the restored riparian habitat in the realigned channel is expected to have a beneficial impact on the watercourse and associated fish habitat form and function.

Hydrology

To mitigate potential impacts to fish habitat hydrology and water quality, the proposed SWM strategy includes the following mitigative approaches:

- A SWM pond to provide quantity, quality and erosion control criteria for all SWM discharge to watercourse WHT2(2)1-1b downstream from the Subject Lands.
- Conveyance of flows from the upstream end of WHT1(6)3-1 to the realigned WHT1(6)4-1 corridor to ensure these flows remain within an open channel and continue to be conveyed to the Gore Road Tributary to maintain hydrology of that fish habitat feature.
- A clean water collection system to collect and convey flows to the upstream end of the wetland at the downstream end of WHT1(6)3-1 to maintain flows and discharge to this wetland, the associated watercourse and the downstream Gore Road Tributary.
- LID measures intended to promote infiltration to maintain site-wide water balance on the Subject Lands.

Together, these measures are intended to preserve the form and function of watercourses providing direct fish habitat and maintain the important functions of the HDF providing indirect fish habitat.

Together, these integrated stormwater management measures are expected to maintain hydrological functions and prevent negative impacts to fish and fish habitat in downstream receiving watercourses. By supporting water balance, preventing excessive erosion, and preserving water quality, the proposed SWM strategy provides protection for fish habitat within and beyond

the NH Study Area.

Construction Management Practices

The ESC Plan requirements discussed in previous sections will also assist in minimizing the potential for negative impacts on fish and fish habitat.

To prevent negative impacts on fish and fish habitat during channel realignment activities, the following mitigation measures are recommended:

- Construction of the majority of the realigned channel should be completed in the dry, in isolation from the existing channel. This will allow construction to proceed without any direct impacts on the existing channel until the upstream and downstream tie-ins are constructed.
- Construction should occur outside the spring fisheries timing window (March 15 to July 1) to avoid disruption to spawning fish in the feature and downstream receiving watercourse. Construction in the summer is preferred, as the watercourse is expected to be generally dry during this period.
- Work-site isolation measures should be used when constructing the upstream and downstream tie-ins of the realigned channel with the existing channel. This may include a dam and pump system (or provisions for installing one if the watercourse is dry at the time of construction) to isolate the instream work area and bypass any flows present in the watercourse.
- The realigned channel should be stabilized prior to commissioning. Stabilization should be confirmed by a qualified professional before diverting flows into the new channel.
- Other ESC measures, along with spill prevention and response procedures, should be implemented during construction to minimize potential impacts on downstream fish and fish habitat.

With appropriate mitigation, along with monitoring and adaptive management, no negative impacts on fish and fish habitat are expected as a result of the channel realignment. It is

recommended that DFO be consulted on the channel realignment and removal of HDF WHT1(6)3-1 and associated mitigative approaches through the Request for Review process to confirm requirements under the *Fisheries Act*. Overall, the proposed realignment, which incorporates natural channel design, is expected to result in substantial long-term benefits to fish habitat functions.

Mitigation Summary

With the implementation of the proposed mitigation measures— including realigned channel enhancements, setbacks, SWM strategy, and construction management practices—no negative impacts to fish habitat are anticipated. Construction-phase impacts associated with the channel realignment will be minimized through timing restrictions, isolation of in-water works, and stabilization of the new channel prior to flow diversion. Long-term, the realigned channel is expected to enhance fish habitat functions through improved stability, increased morphological diversity, and re-establishment of riparian vegetation. Together, these measures are expected to support the protection and improvement of fish habitat within and downstream of the NH Study Area.

7.3.6 Habitat of Endangered and Threatened Species

Habitat of Endangered and Threatened Species identified within the Secondary Plan Area and the adjacent 120 m is as follows (**Figure 9, Appendix A.1.1**):

- Within the Subject Lands:
 - Confirmed habitat for Redside Dace – endangered in Ontario; and
 - Candidate habitat for SAR Bats – endangered in Ontario
- Adjacent 120 m:
 - Confirmed habitat for Redside Dace;

- Candidate habitat for SAR bats; and
- Candidate habitat for Eastern Meadowlark – threatened in Ontario.

The Confirmed Redside Dace habitat and Candidate SAR bat habitat identified within the Subject Lands are both located within the Greenbelt Plan Area and are outside of the proposed development footprint. The Draft Plan and all proposed SWM Pond grading also falls outside of the required setback for Redside Dace habitat and the 30 m setback from significant woodlands in the Greenbelt Plan Area, although the SWM Pond outlet is proposed within the 30 m woodland VPZ (**Figure 11, Appendix B.1.1**). Consequently, these features are not anticipated to be directly impacted by the proposed development. Candidate and confirmed SAR habitat outside the Secondary Plan will also not be directly impacted by the proposed development.

Potential indirect impacts and mitigation measures for wetlands, woodlands, and valleylands may also apply to these features and are discussed in **Sections 7.3.1, 7.3.2, and 7.3.3**.

7.3.7 Migratory Birds

GEI observed a total of 37 confirmed, probable, or possible breeding bird species within the Subject Lands and adjacent 120 m during breeding bird surveys. Among these, several species known to nest in bare ground environments such as row crop agricultural fields, were documented as probable and confirmed breeders within the Subject Lands.

In accordance with the *Migratory Birds Convention Act*, the proponent is responsible for ensuring that no active bird nests are present within the work area prior to the start of construction. As outlined in the Arborist Report (Cosburn Nauboris Ltd, 2025; submitted under separate cover), tree removals are required as part of the proposed development. Additionally, although groundcover vegetation is limited, potential interactions with migratory birds remain possible, particularly for species that nest on bare ground.

To comply with the *Migratory Birds Convention Act*, tree and other vegetation removals as well as earth-moving activities should occur outside the breeding bird timing window (i.e., outside of

March 31 to August 31). If these activities are planned within the breeding bird timing window, a qualified ecologist should conduct a nest sweep survey no more than 48 hours prior to tree and other vegetation removal as well as ground-disturbing activities. This survey will confirm whether construction can proceed without impacting migratory birds or their nests.

7.3.8 Potential Induced Impacts

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

7.3.8.1 Encroachment

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

To mitigate these impacts, the proposed development includes ecological setbacks that reduce the interface between residential uses and natural areas, thereby discouraging informal access and minimizing disturbance. To further support the function of these buffers, all rear yards that back onto the NHS will be fenced without gates, and no formal trails are proposed within the NHS or associated ecological setbacks. Together, these measures are intended to minimize the potential for human encroachment into protected areas, such as through mowing, dumping of yard waste, or informal gardening.

In addition, a brochure should be prepared and distributed to homeowners bordering the NHS to raise awareness of the potential impacts of residential activities on adjacent natural features. This

brochure should include information on fertilizer and pesticide use, responsible gardening practices (e.g., using native rather than non-native plants), proper yard waste disposal, and pet management (e.g., keeping domestic cats indoors).

With implementation of these measures—alongside ecological setbacks—no negative impacts on the ability of the buffers to protect the form and function of the adjacent natural features are anticipated.

7.3.8.2 Recreational Use

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

To mitigate these impacts, the proposed development includes ecological setbacks that create a buffer between residential areas and natural features, helping to discourage recreational use and informal access, including ad-hoc trail creation. As noted in **Section 8.3.8.1**, no formal trail systems are planned within the NHS or its associated setbacks, and all rear yards that back onto the NHS will be fenced without gates. These measures will limit unintentional recreational pressure on sensitive areas and reduce the potential for disturbance or the spread of invasive species.

7.3.8.3 Artificial Light

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

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

7.3.8.4 Noise Pollution

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

To mitigate these impacts, the proposed development includes ecological setbacks that provide physical separation from noise sources, helping to reduce sound levels reaching natural features and maintain more suitable acoustic conditions for wildlife.

7.3.8.5 Cumulative Impacts

Cumulative impacts refer to the combined, long-term effects of multiple stressors associated with development—including artificial light, noise, human presence, encroachment, and hydrological alteration—on the ecological integrity of retained and downstream natural features. While any one activity may appear minor in isolation, the layering of these influences over time can degrade habitat quality, reduce biodiversity, and impair ecosystem functions, particularly along feature edges or in already fragmented landscapes.

To address these risks, the proposed development integrates a series of mitigation measures aimed at reducing both individual and cumulative impacts. These include ecological setbacks from natural features, the exclusion of formal trails within the NHS and associated setbacks, and permanent fencing to limit encroachment. Education materials for adjacent homeowners will further support stewardship and minimize additional stressors such as inappropriate landscaping

practices or free-ranging pets. Together, these measures are intended not only to prevent localized degradation but also to reduce the incremental pressures that often drive long-term ecological decline.

From a hydrological perspective, the removal of the HDF WHT1(6)3-1 within a developing landscape has the potential to result in cumulative changes to downstream flow regimes and water quality, which in turn could affect fish habitat. However, as described in this report, the HDF proposed for removal on the Subject Lands provides only limited ephemeral flow contributions, and the proposed SWM strategy and watercourse realignment is designed to maintain water balance, prevent excessive erosion, enhancement riparian habitat and function conditions and preserve water quality in downstream aquatic systems. As such, no cumulative impacts on fish habitat are anticipated.

7.4 Conceptual Restoration and Enhancement Strategy

This section outlines a conceptual restoration and enhancement strategy to demonstrate how ecological features and functions will be replicated or enhanced within the Proposed NHS. The Proposed NHS builds on the Existing NHS described in **Section 2.6** of this LSS and integrates additional components identified in the SABE Scoped SWS, Part B (Wood et al. 2022), including more detailed considerations for linkages and enhancements.

Per Section 2.5.2.2 of the Scoped SWS Part A “it is recognized that the Scoped SWS [was] based primarily on available information and desktop analysis and that a detailed SWS [should] follow to confirm or refine the approach set out for the Preliminary NHS for the FSA.” As such, this LSS aims to confirm and refine the Preliminary NHS, and for the purposes of this Phase 2 LSS the following terms apply:

- The Preliminary NHS refers to the NHS identified in the SABE Scoped SWS (Wood et al. 2022);
- The Existing NHS refers to the system defined in the Phase 1 LSS (see **Section 2.6**); and

- The Proposed NHS refers to the refined NHS presented in this Phase 2 LSS.

This conceptual strategy is designed to achieve a net gain in ecological function and area within the Proposed NHS, and to support the restoration of impacted wetland and watercourse areas. The strategy outlines high-level restoration and enhancement measures that aim to maintain the long-term integrity and resilience of the NHS. These measures will be further refined in consultation with the Town of Caledon and the TRCA following approval of the conceptual strategy and will be detailed in a Restoration and Enhancement Design Brief. This detailed plan should be led by Certified Ecological Restoration Practitioners (CERPs) and supported by qualified Landscape Architects (LAs), who will prepare the associated design drawings.

7.4.1 Overview of the Settlement Area Boundary Expansion Natural Heritage System

As discussed in Section 2.6.3.1 of the SABE Scoped SWS, Part B (Wood et al. 2022), the Preliminary NHS includes the following components, intended to establish a resilient and connected natural heritage network:

- Key Features;
- Supporting Features;
- Other Features;
- Linkages; and
- Enhancements.

Although refinements to the Preliminary NHS are anticipated through the LSS process, the goal is to maintain or increase the total NHS area, with a focus on enhancing ecological function.

The following subsections describe the Proposed NHS in relation to the SABE Scoped SWS Preliminary NHS components, the Phase 1 LSS findings and Existing NHS components, the

natural environment mitigation hierarchy (**Section 8.2**), and the Phase 2 LSS impact assessment (**Section 8.3**). They also identify high-level goals and objectives as well as best practices for restoration and enhancement.

7.4.2 Natural Heritage Features Proposed for Removal

The Proposed NHS has been developed in accordance with the natural environment mitigation hierarchy outlined in **Section 8.2**, which prioritizes avoidance, minimization, and mitigation of impacts, followed by compensation where necessary. Accordingly, all provincially significant natural heritage features will be retained, and the design of the Proposed NHS incorporates opportunities to enhance ecological function and connectivity across the local landscape.

Some non-significant natural heritage features that are more isolated and impacted within the existing agriculturally influenced landscape are proposed for removal to accommodate the planned development. All areas proposed for removal consist of common, low-diversity communities that have been previously impacted by agricultural land management.

To facilitate the proposed development, watercourse WHT1(6)4-1 is proposed to be realigned in the northeast corner of the Subject Lands, and mitigation ranked HDF WHT1(6)3-1 is proposed to be removed and its function replicated within the aforementioned realigned channel and through a clean water collection system. These features have both been negatively impacted by agricultural activities and currently exhibit signs of excessive active erosion that may be impacting downstream watercourses. The new channel will be designed using natural channel design principles to improve bed and bank stability, enhance morphological diversity, and establish re-naturalized riparian vegetation.

The realignment of WHT1(6)4-1 and removal and functional replication of HDF WHT1(6)3-1 will also require the removal of three highly impacted riparian wetlands along these drainage features, totaling approximately 0.035 ha of proposed wetland removal. These proposed wetland removals will be compensated for via wetlands that will be established along the realigned channel at a minimum 1:1 replication ratio. These created riparian and overbank wetlands will support local

biodiversity and riparian buffer functions in support of a net gain in both ecological function and area.

Several small areas of cultural meadow on the tablelands adjacent to the West Humber River valleyland within the Greenbelt Plan area will also be impacted by the proposed SWM Pond. These areas were identified as Supporting Features. However, through the proposed buffer enhancements, the area of cultural meadow on the Subject Lands is expected to be substantially increased. Removal of small portion of the existing meadow is not expected to have a negative impact on the form and function of this meadow habitat.

Ultimately, the creation of the realigned channel and associated wetlands is expected to improve the ecological function of the channel and provide long-term benefits to in-situ and downstream aquatic systems. Proposed feature removals and encroachments are shown in **Figure 12 (Appendix B.1.1)**.

7.4.3 Ecological Offsetting Approach

Ecological offsetting is a mitigation strategy used to compensate for unavoidable impacts to natural heritage features, applied only after all reasonable opportunities for avoidance, minimization, and mitigation have been exhausted. In alignment with the natural environment mitigation hierarchy outlined in **Section 8.2**, offsetting is proposed in this case to ensure that a net ecological benefit is achieved through targeted restoration and enhancement efforts. This approach is subject to the approval of the applicable planning authority and will be carried out in accordance with the TRCA's 2023 *Guideline for Determining Ecosystem Compensation*.

To offset ecological and biophysical impacts resulting from the removal of 0.035 ha of staked wetland compensation is proposed through wetland creation within the realigned channel at a minimum 1:1 ratio. These restoration and enhancement efforts are intended to support the long-term integrity of the Proposed NHS by enhancing biodiversity, hydrological function, and habitat connectivity across the landscape.

Further details, including restoration goals and objectives, applicable design guidelines, and a

high-level restoration concept plan, are provided in the following subsections.

7.4.3.1 Municipal Ecological Offsetting Guidelines

At present, neither the Town of Caledon nor the Region of Peel have a formal ecological offsetting guideline. However, the Town of Caledon’s Official Plan (2025) provides direction for compensation in certain circumstances within the SABE. Section 13.10.2 of the Caledon Official Plan (2025) states that ecosystem replication or compensation may be considered only after avoidance, minimization, and mitigation options have been evaluated. Section 13.10.9 further notes that replication may be appropriate in situations where retaining a feature in situ within an urbanizing landscape would result in impacts that cannot be reasonably mitigated.

The Town's ecosystem compensation guideline is referenced in Section 13.3.4 of the Caledon Official Plan (2025), alongside applicable conservation authority requirements. The SABE Scoped SWS, Part B (Wood et al. 2022b) outlines two types of compensation: “Like-for-Like Compensation”, which replicates the same habitat type, and “Alternative Habitat Compensation”, which introduces different but ecologically valuable habitat types. In line with both the Caledon Official Plan (2025) and the SABE Scoped SWS (Wood et al. 2022), compensation should only proceed where it offers a net ecological benefit and where other options have been reasonably considered.

7.4.3.2 Toronto and Region Conservation Authority Ecological Offsetting Guidelines

The TRCA’s 2023 *Guideline for Determining Ecosystem Compensation* provides a framework for addressing unavoidable impacts to natural heritage features. The TRCA Compensation Guideline is grounded in a mitigation hierarchy—avoid, minimize, mitigate, and finally compensate—which aligns with the approach described in **Section 8.2** of this report.

When compensation is required, the TRCA Compensation Guideline outlines methods for determining appropriate replacement areas, applying compensation measures, and monitoring

outcomes. Two key principles inform compensation requirements: replication of ecosystem structure (e.g., basal area for treed communities) and land base (e.g., area of natural feature removed). Compensation must ensure no net loss of natural area, with a minimum 1:1 ratio applied to land base. Compensation ratios may vary by feature type, with open communities generally requiring lower ratios than treed communities due to differences in structure and recovery timelines.

7.4.4 Ecological Restoration Goals and Objectives

The restoration strategy for the Subject Lands is intended to enhance and expand the NHS through targeted restoration and enhancement efforts that support long-term ecological function and landscape connectivity. Restoration activities will focus on the implementation of natural channel design along the realigned watercourse (including riparian vegetation enhancements and wetland creation to replace the wetlands lost or altered along the existing drainage features proposed for removal or realignment) and ecological enhancements within buffers that currently lack naturalized native vegetation communities. The restoration goals and objectives that will guide the proposed ecological offsetting strategy are outlined below.

The restoration goals consist of the following:

1. Establish restored wetland and watercourse features that replicate/enhance the ecological structure and function of impacted areas and enhance landscape-level connectivity.
2. Support natural hydrological processes through the application of natural channel design and the establishment of appropriate wetland hydroperiods.
3. Increase native species richness and improve vegetation community structure within the restoration areas (realigned watercourse and natural heritage feature buffers).
4. Enhance habitat diversity and complexity to support a range of native wildlife.

5. Minimize anthropogenic disturbance and promote the long-term integrity and resilience of the NHS.
6. Contribute to climate adaptation and mitigation through increased natural cover and biodiversity.

The restoration objectives consist of the following:

1. Align restoration efforts with the policies of the Town of Caledon and the TRCA, as well as current best practices in ecological restoration.
2. Create a naturalized watercourse corridor using natural channel design principles, including appropriate meander geometry, substrate composition, and riparian vegetation.
3. Construct wetland features within the realigned watercourse corridor with suitable topography and hydrological inputs to support riparian wetland communities.
4. Plant a diverse mix of native species sourced from appropriate seed zones to establish resilient, self-sustaining vegetation communities.
5. Select plant species that enhance wildlife foraging opportunities and support pollinators.
6. Monitor site conditions and vegetation performance to support adaptive management and ensure successful restoration outcomes.

7.4.5 Conceptual Ecological Restoration Plan

As discussed in the SABE Scoped SWS (Wood et al. 2022) and summarized in **Section 2.2.3.2.2** of this LSS, general targets were established for the Preliminary NHS to inform land use planning and decision making within the SABE lands, with the goal of achieving a net benefit to the NHS. The SABE recognizes that certain vegetation communities—such as open/early successional habitats, wetlands, and woodlands—may be removed through future development. These communities are identified in Table 2.3.5.5 of the SABE Scoped SWS, Part B (Wood et al. 2022).

Significant natural features have been identified for protection as part of the NHS, while opportunities for protection, enhancement, or restoration of supporting features and functions are encouraged where feasible.

Specific ecosystem compensation requirements have not been prescribed through the SABE Scoped SWS and were instead deferred to site-specific studies, such as this Phase 2 LSS, to determine appropriate on-site compensation. In accordance with SABE NHS targets, no net loss in wetland or woodland cover is permitted, and cash-in-lieu compensation is not recommended within the Study Area. If cash-in-lieu compensation is considered through future planning applications, it must be consistent with the TRCA's *Guideline for Determining Ecosystem Compensation* (2023), which accounts for the cost of restoring both ecosystem structure and land base. However, the primary intention remains implementation of on-site ecological compensation to ensure a net gain in ecological function and area within Caledon's existing NHS.

All compensation measures associated with removal of 0.035 ha (350 m²) will be designed in accordance with the TRCA's Compensation Guideline. Site-specific implementation of this offsetting strategy will be guided by the restoration goals and objectives outlined in **Section 8.4.4**. This approach is expected to result in net ecological gain by replacing low-functioning, agriculturally impacted features with strategically located wetland and riparian habitats in the realigned channel corridor that support the integrity of the broader NHS.

7.4.5.1 Wetland Restoration

For the Subject Lands, compensation is proposed for approximately 0.035 ha of unevaluated wetland features that will be removed for the proposed realignment of the WHT1(6)4-1 watercourse, and removal and functional replication of HDF WHT1(6)3-1.

These features will be replaced through restoration efforts that improve ecological function, connectivity, and resilience within the Subject Lands. The removed wetlands are small, riparian-associated communities, previously impacted by agricultural activities. In contrast, the replication wetlands within the realigned channel will be designed to support more complex habitat structure,

and native species assemblages. As such, these measures are expected to result in a net ecological gain relative to existing impacted conditions.

Wetland replication will occur at a minimum 1:1 ratio, within the realigned channel, with exact replication ratios to be determined when additional details are available about the proposed channel realignment. The realigned channel corridor is being designed using fluvial geomorphic principles (see **Section 8.4.5.2**) and replication wetlands along the channel are intended to enhance terrestrial and aquatic habitat within the corridor by increasing ecological diversity and floodplain complexity. Depressional storage areas within the corridor are expected to sustain wetland and wet meadow vegetation, contributing to water polishing, sediment retention, and moderated flow into the Gore Road Tributary offsite (see **Section 3.0** for additional detail).

Drawings F-01 – F-03 (Appendix B.2.1) identify the proposed locations for wetlands within the realigned watercourse corridor. All created wetlands will be buffered by a minimum 10 m vegetation protection zone, consistent with TRCA policies. These setbacks will be vegetated using a native upland seed mix, as described in **Section 8.4.5.3**, which will provide additional protection for the created wetlands and support long-term ecosystem stability.

7.4.5.2 Natural Channel Design

To support aquatic ecosystem health and improve overall watercourse corridor function, the existing degraded watercourse WHT1(6)4-1 in the northeast portion of the Subject Lands will be realigned with a naturalized, meandering channel reach. The function of mitigation ranked HDF WHT1(6)3-1 will also be partially replicated through this proposed realigned channel. The new channel has been designed by GEI using fluvial geomorphic principles, with the goal of restoring natural channel processes, improving aquatic and riparian habitat conditions, extending wet and dry periods, and integrating wetland and riparian features into a cohesive ecological corridor (see **Appendix B.2.1**).

The stream length within the realigned channel will be slightly longer than the existing watercourse resulting in an overall increase in area and associated habitat. Meander belt width and channel

dimensions have been designed to maintain long-term stability while increasing ecological value.

7.4.5.3 Seeding of the Natural Heritage System Buffer

Outside of the Draft Plan footprint, all currently non-vegetated areas or fallow agricultural fields in various states of succession within feature setbacks and/or within the Greenbelt Plan Area will be seeded with a native seed mix. Exact seed mixes to be applied will be determined at detailed design based on moisture and light conditions in each area to be seeded; however, meadow seed mixes will generally be targeted. All mixes will target inclusion of herbaceous groundcover species to establish diverse, self-sustaining meadow habitat.

The resulting vegetation will promote the development of suitable conditions for ground-nesting birds and provide important resources for pollinators and the species that rely on them. Establishing native habitat in these areas will enhance local biodiversity, support wildlife movement, and contribute to a more structurally and functionally diverse NHS.

7.4.6 Next Steps and Implementation

The restoration and enhancement strategy presented in this Phase 2 LSS is conceptual and intended to guide early-stage planning and discussions with the Town of Caledon and the TRCA. The ecological restoration approach, including channel realignment, wetland creation, and buffer planting reflects current site conditions and policy frameworks and will be further refined in consultation with the Town of Caledon and the TRCA following approval of the conceptual strategy.

The detailed ecological restoration approach will be provided in a Restoration and Enhancement Design Brief to support implementation. This detailed plan should be led by CERPs and supported by qualified LAs, who will prepare the associated design drawings. The Design Brief will outline:

- Site-specific restoration designs and supporting drawings (e.g., grading, planting, and soil preparation plans);

- Selection of native species sourced from appropriate seed zones;
- Placement of wildlife habitat features and erosion control measures; and
- Invasive species management strategies, if required.

The Restoration and Enhancement Design Brief will also consider relevant site-specific factors such as hydrology, soil conditions, and topography. Reference ecosystems and/or ELC-based target communities will guide the selection and design of vegetation communities, and wetland hydroperiod requirements will inform water balance and habitat function. The plan will also identify opportunities for habitat enhancements that support target wildlife groups such as bats, amphibians, birds, and pollinators.

7.5 Proposed Natural Heritage System

The Proposed NHS for the Subject Lands builds upon the Existing NHS described in **Section 2.6**, with refinements to account for proposed watercourse realignment, Mitigation HDF removal and the conceptual restoration and enhancement strategy outlined in **Section 8.4**. It incorporates ecological offsetting measures for the minor amount of wetland removal that is proposed.

The Proposed NHS was delineated in accordance with the natural environment mitigation hierarchy (**Section 8.2**), applicable planning policies, and technical guidance, including the SABE Scoped SWS (Wood et al. 2022), the TRCA's *Guideline for Determining Ecosystem Compensation* (2023), and relevant municipal and provincial frameworks. Where feasible, the Proposed NHS maintains and enhances the structure, function, and connectivity of natural heritage features and their associated VPZs.

Figure 14 (Appendix B.1.1) illustrates the Proposed NHS, including all retained natural features, enhancement areas, and linkages.

The key components of the Proposed NHS are as follows:

- **Wetlands (Retained and Created):** All wetlands within the Greenbelt Plan Area (both on site and within 120 m of the Subject Lands) will be retained as discussed in **Section 8.3.1**. Within the remainder of the Subject Lands, three small unevaluated wetlands, (totaling ~0.035 ha) will be removed and compensated for through the creation of new wetland features along the realigned channel at a minimum 1:1 ratio. Wetlands within 120 m of the Subject Lands and outside the Greenbelt Plan Area will also be retained
- **Woodlands (Retained):** The three significant woodlands within the Greenbelt Plan Area (the CUW1/THDM2-6 on site and the FOD and FOD/FOD5-1/SWD3-3 features within 120 m of the Subject Lands) will be retained as discussed in **Section 8.3.2**. No other woodlands within the Subject Lands or the adjacent 120 m meet the criteria for significance and are therefore not included in the Proposed NHS.
- **Valleylands (Retained):** The West Humber River valleyland will be retained as discussed in **Section 8.3.3**. No other valleyland features were identified within the Subject Lands or the adjacent 120 m.
- **Watercourse Corridors and associated Fish Habitat (Retained and Realigned):** The West Humber River (providing direct fish habitat) and the WHT2(2)1-1b watercourse (providing candidate direct fish habitat) will be retained on site as discussed in **Section 8.3.5**. The WHT1(6)4-1 watercourse in the northeast corner of the Subject Lands (also providing direct fish habitat) is proposed to be realigned and restored to provide a functional, naturalized corridor. This realigned channel has been designed with natural channel design principles and expected to provide enhanced fish habitat functions. Indirect fish habitat associated with WHT1(6)3-1 is proposed to be removed, but the indirect fish habitat functions will be maintained within the realigned corridor (where flows from WHT1(6)3-1 originating off-site will be piped) of through the proposed clean water collector system that will maintain discharge to the downstream wetland/watercourse.
- **Natural Hazards:** The Proposed NHS incorporates hazard features and associated setbacks, including setbacks from the staked top of bank along the West Humber River valleyland, and

meander belt and erosion hazards from the realigned channel. The proposed channel realignment addresses these hazards through appropriate siting and design.

- **Vegetated Buffers:** Minimum setbacks have been applied to KNHFs, KHFfs, and natural hazards in accordance with relevant policies (see **Section 8.6.2.2**).

As previously discussed in **Section 2.6.1**, the Preliminary NHS originally included both a conceptual linkage (linkage 08, Figure DA2-10 of the Scoped SWS Part B) and a ‘shape, size, and contiguity’ enhancement area (Figure DA2-11c of the Scoped SWS Part B). As described in the SABE “it is recognized that the Scoped SWS [was] based primarily on available information and desktop analysis and that a detailed SWS [should] follow to confirm or refine the approach set out for the Preliminary NHS for the FSA.” After on-site investigations, it was determined that the ‘supporting feature’ originally mapped as a ‘shape, size, and contiguity’ enhancement on site consists of a Dry-Moist Old Field Meadow (CUM1-1) / Disturbed (DIST) area (**Figure 4, Appendix A.1.1**). Consequently, there is no rationale for enhancement of this feature. Instead, enhancements are proposed to be provided along the realigned channel in the northeast corner of the Subject Lands (see **Section 9.0**). Furthermore, the lands to the south and east of the site are anticipated to continue to provide agricultural linkage between The Gore Road Tributary and tributary of the West Humber River; therefore, a linkage is not proposed within the Subject Lands. The requirements for this linkage (to connect the West Humber River corridor with the Gore Road Tributary Corridor) should be assessed through the adjacent Secondary Plan process.

Restoration and enhancement measures will focus on increasing native species diversity, improving wetland and riparian habitat structure, and creating a variety of microhabitats for wildlife. These measures will be further refined in consultation with the Town of Caledon and the TRCA following approval of the conceptual strategy and will be detailed in a Restoration and Enhancement Design Brief.

8.0 Fluvial Geomorphology

8.1 Erosion Mitigation Assessment

Upon completion of the erosion analysis (including the detailed geomorphic assessment, erosion threshold analyses, erosion sensitivity analyses, and erosion exceedance analyses), recommendations surrounding potential mitigatory measures will be provided as part of a resubmission.

8.2 Proposed Conceptual Corridor Design

As described in **Section 3.0**, reach WHT1(6)4-1 was historically straightened for agricultural purposes, and is occasionally ploughed to the edge of the feature, generally preventing growth of riparian vegetation. This feature represents direct fish habitat and is proposed for realignment with a natural corridor design. GEI expects a vegetated and shaded corridor will provide a net ecological gain compared to the existing agricultural conditions surrounding this feature.

A conceptual design of the realigned channel is provided in **Drawings F-01 through F-03, Appendix B.2.1**.

8.2.1 Overview of Corridor Design

Given that the existing drainage feature has been historically modified by straightening and channelization, a meander belt based on the existing channel dimensions was not deemed to be appropriate in defining the channel corridor. Rather, the proposed channel realignment was sized according to modelled flows, as identified by SCE.

Channel dimensions are identified via bankfull discharge, as this represents what is generally considered the channel-forming discharge or the dominant discharge. The bankfull discharge is the flow that reaches the transition between the channel and its floodplain (Leopold et al. 1964) and is significant because it is the flow at which the channel is the most efficient at moving sediment, forming or removing bars, forming or changing bends and meanders, and generally

doing work that results in the shaping of the channel (Dunne & Leopold 1978). Typically, the recurrence interval/frequency of the bank forming flow event is that of the spring freshet, or 1:2-years recurrence.

The bankfull discharge can be identified using different methods; the most typical is to back calculate the flow from a ‘reference reach’, based on field indicators of bankfull geometry. As noted, the existing channel has been historically modified, with sections that are poorly defined. Therefore, hydrologic modelling completed by SCE was used to identify an appropriate bankfull discharge. The 2-year flow provided by SCE was equal to 0.71 m³/s.

The bankfull discharge was calculated to be approximately equivalent to three-quarters of the 1:2-year flow. Therefore, the corresponding bankfull discharges for the proposed realignment channel was calculated to be 0.53 m³/s. The channel was sized by iteratively adjusting the dimensions, until the bankfull flow could be accommodated within the channel. The gradient of the channel, provided by SCE, is proposed to be approximately 1%. To determine a typical bankfull width for the proposed channel, an iterative process involving Manning’s equation, presented below, was applied,

$$Q = \frac{A}{n} R^{\left(\frac{2}{3}\right)} \sqrt{S_0}$$

Where Q is flow in m³/s, A is the area in m², R is the hydraulic radius in m, and S_0 is the bed slope. The typical bankfull width of a trapezoidal-bottom channel associated with the proposed corridor’s gradient and discharge was calculated to be approximately 2.2 m.

Using these channel dimensions, an empirical approach was used to identify the meander belt width. There are a variety of empirical models available, which use simple power functions based on in-situ measurements of average channel dimensions. The methods, presented in [Section 4.1: Meander Belt Delineation](#) include those outlined by Williams involving bankfull width (W_b), (1986 – equation 1), Ward et al. involving bankfull width (2002 – equation 2), Lorenz et al. (1985 – equation 3), and a linear model presented by Howett (2017 – equation 4).

The results of the empirical approach are presented in **Table 8-1** below, and suggest a minimum

proposed corridor width of approximately 17.3 m.

Table 8-1 Empirical Corridor Sizing Results

Method	Width
Williams (1986)	14.8 m
Ward et. al. (2002)	18.6 m
Lorenz et al. (1985)	18.6 m
Howett (2017)	17.1 m
Average	17.3 m

A final corridor of 18.9 m was delineated to provide additional space for riparian wetlands and other habitat enhancement components.

8.2.2 Overview of Channel Design

The approximately 340 m long corridor is proposed to contain a channel restoration design to replace the existing reach of the watercourse on the Subject Lands. The main objective was to realign the reach to a new location, providing a transition between the culvert conveying flow under Healey Road and the relatively undisturbed watercourse downstream of the realignment, and to provide enhanced aquatic and terrestrial habitat, where possible. Geomorphological and hydraulic considerations, in combination with the results of the field investigation, informed the channel planform and cross-sectional dimensions. The channel design is included in **Appendix B.2.1**.

The following points summarize consideration and constraints relevant to the proposed channel design:

- Tie-in limits: the proposed channel design was developed to tie-in to the existing culvert at the upstream extent of the realignment and downstream of the existing channel, based on the topographic survey;
- Channel planform: the channel planform was developed in consideration of the upstream and downstream tie-in locations, and historic channel alignment, based on aerial

photograph interpretation and LiDAR topography; and

- Habitat enhancement components: additional habitat enhancement components (such as riparian wetlands, online wetlands, rock piles, raptor poles) will be incorporated into the overall design.
- Riparian and terrestrial habitat enhancement: the newly restored channel banks and floodplain would be planted to provide enhanced shading and vegetative cover.

8.2.2.1 Channel Realignment

The proposed realignment flows between several wetlands consisting of new features integrated into the realignment design. Additionally, a large online wetland is situated approximately halfway along the alignment, at a bend, and will serve in part as an energy dissipator. As such, reach breaks were placed at each end of the large online wetland, resulting in the delineation of two separate reaches. Reach 1 is the most upstream reach, just downstream of the Healey Road crossing, while Reach 3 is the most downstream reach, flowing between the online wetland and the eastern boundary of the Subject Lands.

There are several methods to determine an appropriate bankfull discharge, including through a survey of a 'reference reach', based on field indicators of bankfull geometry. However, due to the lack of a clear reference reach, back-calculation of bankfull discharge was not deemed to be relevant. Therefore, the bankfull discharge was calculated through hydrological modelling completed by SCE, as noted in the previous section. The design bankfull discharge was assumed to be approximately equal to three quarters of the 2-year flow ($0.71 \text{ m}^3/\text{s}$), and is therefore equal to $0.53 \text{ m}^3/\text{s}$.

Channel dimensions were designed to be identical between Reaches 1 and 2. Proposed riffle and pool bankfull depths were designed to be 0.35 m and 0.70 m respectively, while riffle and pool bankfull widths were designed to be 2.5 m and 3.0 m respectively. The channel was sized using Manning's equation, provided in the previous section. The channel was sized by iteratively

adjusting the dimensions, until the bankfull flow could be accommodated within the channel. The average bankfull gradient was designed to be 0.65%, while the average riffle gradients for were designed to be 3.8%.

8.2.2.2 Channel Realignment Wetland Enhancements

As noted above, as part of the drainage feature realignment design, the channel will include the creation of approximately 0.21 ha of riparian wetland habitat. These riparian wetlands will be located along the length of the drainage feature and will include a variety of wetland vegetation communities including Willow Thicket Mineral Swamp (SWT2-2), Cattail Shallow Marsh (MAS2-1), and Mineral Meadow Marsh (MAM2). These wetlands are expected to be hydrologically supported by precipitation and their proximity to the realigned watercourse.

9.0 Groundwater

9.1 Hydrogeological Assessment

As a part of the Phase 2 investigation, the following assessments have been completed, and the results are presented in the report titled “*Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon*”, Reference Number: 2405-W038, Rev.1, dated March 3, 2026, prepared by Soil Engineers Ltd. The following summary presents the findings of the aforementioned hydrogeological assessment.

Alcan Holdings Inc. retained Soil Engineers Ltd. (SEL) to conduct a hydrogeological assessment for the property located at 12879 The Gore Road in the Town of Caledon, Ontario (the Subject Site).

The Subject Site is located at the southeast corner of Gore Road and Healey Road. The Subject Site is surrounded by Healy Road and the Gore Road to the north and west, respectively, agricultural fields and rural residential properties to the east, and agricultural and vacant lands to the south.

Based on a Preliminary Lotting Concept Plan dated January 30, 2026, by KLM Planning Partners, the proposed development will consist of a low-density residential area and an urban corridor, channel block, new roadways, municipal services and a reserved park block and a stormwater management pond block.

The current investigation revealed that:

- The subsoil investigation has revealed that beneath the topsoil veneer, the Subject Site mainly comprises silty clay till with a localized silt deposit in the lower stratigraphy at deeper depth. The silty clay deposits were also encountered above or beneath the silty clay till in the eastern portion of the Subject Site.
- The lowest and highest stabilized shallow groundwater levels were measured at El. 232.6 masl and 246.7 masl at BH/MW 102 and BH/MW 1, respectively. The interpreted shallow groundwater flow direction is mainly towards the southeast/east.
- The geometric mean of in-situ hydraulic conductivity for silty clay till estimated in BH/MW 1, 2, 3, 4 and 5 is 1.4×10^{-8} m/s, and it is 3.4×10^{-8} m/s for silty clay till that was measured in BH/MW 7.
- A review of groundwater quality test results for the unfiltered groundwater sample collected from monitoring well (BH/MW 1) indicates that the concentration of total manganese and total zinc exceeded the Region of Peel Storm Sewer Use By-Law parameters, but met the Sanitary Sewer Use By-Law parameters. The results suggest that any construction dewatering or foundation drainage effluents should be acceptable for discharge to the Region of Peel sanitary sewer without any pretreatment system needed. The anticipated effluents would not be acceptable for discharge to the Region of Peel storm sewer system. However, implementing pre-treatment to lower total manganese and total zinc to meet the Region of Peel Storm Sewer Use By-Law may permit its discharge to the Region of Peel Storm Sewer system.
- The estimated preliminary maximum short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed installation of the underground services, reaches up to 7,850.0 L/day, considering an open and active excavation trench with dimensions of 2 m width and 50 m length. As such, filing an EASR with the MECF is not required for the excavation and construction of the proposed underground services if the excavation and installation of the underground services are completed over phases. Furthermore, the estimated flow rates consider the seasonally high shallow groundwater table. As such, if excavation and construction are completed during dry seasons of a year, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge

agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system

- The estimated preliminary maximum short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed townhouse blocks, reaches up to 29,600.0 L/day. As such, filing an EASR with the MECP is not required for the proposed residential lot and block. However, the estimated flow rates are considering the seasonally high shallow groundwater table. As such, if excavation and construction is completed during dry seasons of a year and over phases, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system
- The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed SWM Ponds, reached up to 475,650.0 L/day. As such, filing an EASR with the MECP is required for the construction of the SWM Pond. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system
- The maximum estimated preliminary long-term foundation drainage flow rate of 3,400.0 L/day is below the MECP PTTW threshold limit of 379,000.0 L/day for the proposed development. As such, applying for PTTW with MECP is not required. However, obtaining a discharge agreement from the Region of Peel is required if the foundation drainage is proposed to be conveyed to the Region's sewer system.
- The concentration of total manganese and total zinc exceeded the Region of Peel Storm Sewer Use By-Law parameters, but met the Sanitary Sewer Use By-Law parameters. The results suggest that any construction dewatering or foundation drainage effluents should be acceptable for discharge to the Region of Peel sanitary sewer without any pretreatment system needed. The anticipated effluents would not be acceptable for discharge to the Region of Peel storm sewer system. However, implementing pre-treatment to lower total manganese and total zinc to meet the Region of Peel Storm Sewer Use By-Law may permit its discharge to the Region of Peel storm sewer system. The final design for any temporary or long-term construction dewatering effluent pre-treatment system

is the responsibility of the contractors responsible for construction, or the water treatment system design specialists, if required.

- The maximum anticipated conceptual Zone of Influence (ZOI) for dewatering extends up to 5.6 meters from the dewatering area for the installation of underground services within the eastern portion of the Subject Site. For the construction of the proposed residential lots and townhouse blocks, the ZOI reaches up to 3.9 meters from the dewatering area. For the construction of the proposed Stormwater management pond, the ZOI reaches up to 2.6 meters from the dewatering area. A review of the records indicates that there are no structures or roads located within the Conceptual Zone of Influence from the dewatering area of the installation of the proposed underground services, the storm water management pond, the construction of the proposed house lots and townhouse blocks. Therefore, no risk is anticipated for the ground settlement. However, the recommendation on the ground settlement and conceptual zone of influence for dewatering needs to be assessed once the detailed design becomes available for review. Based on the review of the provided plan, it is understood that the tributary located in the northern portion, identified as WHT1(6)4-1, is proposed to be realigned into the proposed channel block. Therefore, no impacts are anticipated for the northern tributary of the West Humber River. Based on the review of the plan, it is understood that the existing tributaries located in the central portion, identified as WHT1(6)3-1(a), WHT1(6)3-1(b) and the southern portions identified as WHT2(2)1-1a of the Subject Site are proposed to be removed with function replicated as per Figure 12 Natural heritage Feature Alteration dated February 25, 2026 prepared by GEI Consultants during the development. It is important to note that the creeks are located within the TRCA-regulated area. Therefore, permission may be required for the decommissioning of the existing creeks on the Subject Site. The watercourse identified as WHT2(2) is located within the proposed NHS area block. Therefore no impacts are anticipated to the watercourse.
- A review of the MECP well records indicates that there are no records for water supply wells that are registered within the Subject Site boundary and the conceptual ZOI for dewatering. Considering the current available data, significant impacts to water supply wells are not anticipated for the proposed development. However, potential risk should be assessed when further details and plans become available for review.

9.2 Water Balance and Groundwater Recharge

Additionally, as outlined in the Local Subwatershed Study (LSS) Terms of Reference dated July 2025, a site-wide pre- and post-development water balance assessment is required. Soil Engineers Ltd. has proposed the corresponding scope of work to undertake this assessment as part of the current study.

9.3 Water Supply Wells

The desktop assessment of existing water supply wells, conducted to identify groundwater use within the study area, has been completed as part of the Phase 1 investigation. This assessment involved reviewing the MECP Water Well Records database to identify potential nearby groundwater users. The findings of this review, along with the associated analyses, are presented in the report titled “Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon”, Reference Number: 2405-W038, Rev.1, dated March 2, 2026, prepared by Soil Engineers Ltd. The following summary presents the findings of the aforementioned hydrogeological assessment.

Additionally, as outlined in the Local Subwatershed Study (LSS) Terms of Reference dated July 2025, a door-to-door private well survey is to be completed for all residences located within 500 m of the Subject Site. Soil Engineers Ltd. has proposed the corresponding scope of work to undertake this assessment as part of the current study.

9.4 Monitoring

As mentioned, the report titled “Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon”, Reference Number: 2405-W038, Rev.1, dated March 2, 2026, prepared by Soil Engineers Ltd. The Seven (7) previously installed monitoring wells were utilized to measure and monitor groundwater levels. Monitoring wells were developed on June 28, 2024, and the groundwater monitoring program confirmed the stabilized groundwater level beneath the Subject Site. The stabilized groundwater levels were manually

measured over eighteen (18) monitoring events from June 28, 2024, to February 12, 2026, with the results presented in Section 7.1 of the hydrogeological assessment report dated March 2, 2026. Additionally, a groundwater monitoring program was conducted over three (3) monitoring events between January 22, 2026 and February 12, 2026, in the newly installed monitoring wells within the footprint of the proposed stormwater management pond at the Subject Site and the findings are presented in the hydrogeological assessment report dated March 2, 2026. The groundwater monitoring program is still ongoing, and the findings will be presented in the updated hydrogeological assessment report.

10.0 Surface Water

10.1 Hydrologic Assessment

The *Downstream Analysis Report* by Schaeffers Consulting Engineers shall detail the hydrological assessment (2025) and catchment discretization applied for this analysis (to be included under **Appendix A.5.1**). The report will summarize the catchment discretization undertaken for the Post Development condition considering the Subject Site (SCE Post Dev Scenario) as well as proposed future conditions which considers the Bolton West Secondary Plan areas.

Section 0 describes the TRCA VO models used for the hydrological assessment. VO models are updated to represent both the SCE Post Dev Scenario and the Future Post Dev Scenario. These are uncontrolled scenarios without SWM facilities. Catchment areas and input parameters are calculated and applied to the model as will be described in the *Downstream Analysis Report* by SCE (See **Appendix A.5.1**). **Table 10-1** present a summary of peak flows for the SCE Modified Existing model scenario.

Table 10-1: Summary of Peak Flows in the SCE Modified Existing Scenario (m³/s)

Storm	Node				
	West Humber			Gore Tributary	
	729	7607	7603	1848	1962
Regional	145.63	168.20	228.54	31.36	77.65
100	45.52	51.18	68.92	12.08	47.09

10.2 Hydraulic Assessment

The existing conditions peak flows are applied to the HEC-RAS Model. Updated floodplain mapping was generated to represent the existing flood line using the Regional and 100-year 6-hour storm. The mapping and documentation of the results is summarized in the *Floodplain Analysis Report* by SCE (2025) (**Appendix A.3.3**). The *Floodplain Analysis Report* as well further details Flood Vulnerable Areas downstream of the Subject Lands (**Appendix A.3.3**).

A preliminary design the proposed channel realignment was completed to demonstrate the hydraulic feasibility of the channel. Detailed design of the channel will take place at a later stage in the Project design process. The *Floodplain Analysis Report* details the methods and results of the preliminary channel design (**Appendix A.3.3**).

10.3 Climate Impact Assessment

An impact assessment is completed to evaluate precipitation scenarios impacted by climate change on the proposed site and SWM plan. The purpose of this assessment is to provide a preliminary overview of future conditions at the site. Per direction from the TRCA and the Town, the proponent continues to be required to adhere to the design of the regulatory storm in this area.

Watershed level climate scenarios prepared by the TRCA were collected to perform a qualitative analysis. As well notable historical storms and future scenario intensity-duration-frequency (IDF) curves were used to assess the capacity of proposed SWM infrastructure. Historical storms and IDF information were obtained in coordination with the Town of Caledon and the TRCA.

Climate change models analyze various future scenarios to predict future climate. The Intergovernmental Panel on Climate Change (IPCC) defines scenarios used to represent possible future development pathways for societies. These scenarios are called Shared Socioeconomic Pathways (SSP). For this assessment, a medium emissions scenario (SSP2-4.5) and a high emissions scenario (SSP5-8.5) are applied to a timescale of 2071-2100.

10.3.1 Qualitative Review

The TRCA provided climate information for the Humber River Watershed under a memo entitled *Summary of the Climate Projections for the Humber River Watershed and If-Then-So Analysis* (2023). **Table 10-2** and **Table 10-3** summarize key climate parameters relevant to assessing the future hydrological setting of the Subject Site.

Table 10-2: Summary of Modelled Historical and Future Climate for each Climate Period under the SSP2-4.5 Climate Scenario

Climate Parameter	Variable Name	SSP2-4.5 Modelled Historical		SSP2-4.5 Modelled Future		Trend
		1961-1990	1981-2010	2041-2070	2071-2100	
		50 th	50 th	50 th	50 th	
Mean Temperature (°C)	Annual	6.9	7.5	10.3	11.2	↑
	Winter	-5.8	-5.1	-1.7	-0.5	↑
	Spring	5.5	6.1	8.7	9.6	↑
	Summer	18.9	19.5	22.1	23	↑
	Fall	8.7	9.3	11.8	12.7	↑
Maximum Temperature (°C)	Annual	11.9	12.4	15.2	16.1	↑
	Winter	-1.8	-1.2	1.6	2.8	↑
	Spring	10.7	11.3	14	15	↑
	Summer	24.8	25.4	28.3	29.2	↑
	Fall	13.4	14.1	16.7	17.6	↑
Minimum Temperature (°C)	Annual	1.9	2.5	5.3	6.2	↑
	Winter	-9.8	-9	-5.1	-3.7	↑
	Spring	0.3	0.9	3.4	4.2	↑
	Summer	13	13.6	16	16.9	↑
	Fall	3.9	4.6	7	7.9	↑
Total Precipitation (mm)	Annual	805.6	819.9	887.4	900.5	↓
	Winter	174.1	178.3	201	212.7	↑
	Spring	196.3	200.9	224.4	232.2	↑
	Summer	212.3	216.5	222.5	217.3	↓
	Fall	209.5	211.4	229.3	223.5	↓
Extreme Precipitation	Max Precipitation in 1 day (mm)	36.9	36.9	41.2	43.3	↑

	Max Precipitation in 3 days (mm)	54	54.7	60.9	62.9	↑
	Simple Daily Intensity Index (SDII) (mm/day)	5	5	5.4	5.5	↑
	95 th Percentile Precipitation (mm)	11.5	11.7	12.7	12.8	↑
50 th percentile results are summarized above. Refer to <i>Summary of Climate Projections for the Humber River Watershed and If-Then-So Analysis</i> , TRCA, October 10 2023 for full data set.						

Table 10-3: Summary of Modelled Historical and Future Climate for each Climate Period under the SSP5-8.5 Climate Scenario

Climate Parameter	Variable Name	SSP5-8.5 Modelled Historical		SSP5-8.5 Modelled Future		Trend
		1961-1990	1981-2010	2041-2070	2071-2100	
		50 th	50 th	50 th	50 th	
Mean Temperature (°C)	Annual	6.9	7.5	11.1	13.6	↑
	Winter	-5.8	-5.1	-0.7	1.9	↑
	Spring	5.5	6.1	9.6	11.8	↑
	Summer	18.9	19.5	22.9	25.6	↑
	Fall	8.7	9.3	12.7	15.2	↑
Maximum Temperature (°C)	Annual	11.9	12.4	16.1	18.5	↑
	Winter	-1.8	-1.2	2.5	4.9	↑
	Spring	10.7	11.3	14.9	17.2	↑
	Summer	24.8	25.4	29	31.8	↑
	Fall	13.4	14.1	17.5	20.1	↑
Minimum Temperature (°C)	Annual	1.9	2.5	6.2	8.7	↑
	Winter	-9.8	-9	-3.9	-1.1	↑
	Spring	0.3	0.9	4.2	6.4	↑
	Summer	13	13.6	16.8	19.5	↑
	Fall	3.9	4.6	7.8	10.3	↑
Total Precipitation (mm)	Annual	805.6	820.1	892.3	934.2	↓
	Winter	174.1	178.3	206.7	228.5	↑
	Spring	196.3	200.9	229.5	244.6	↑
	Summer	212.3	216.6	215.5	214.2	↓
	Fall	209.5	211.4	227.1	232.2	↑

Extreme Precipitation	Max Precipitation in 1 day (mm)	36.9	36.9	42.9	45.8	↑
	Max Precipitation in 3 days (mm)	54	54.7	62.4	67.3	↑
	Simple Daily Intensity Index (SDII) (mm/day)	5	5	5.5	5.8	↑
	95 th Percentile Precipitation (mm)	11.5	11.7	12.8	13.5	↑
50 th percentile results are summarized above. Refer to <i>Summary of Climate Projections for the Humber River Watershed and If-Then-So Analysis</i> , TRCA, October 10 2023 for full data set.						

Table 10-2 and **Table 10-3** summarize climate model results for the medium emissions scenario (SSP2-4.5) and a high emissions scenario (SSP5-8.5), respectively. Impacts to climate parameters under the 2071-2100 time period relative to the historical values are more significant under the high emissions scenario. However, both scenarios exhibit the same trends across climate parameters. **Table 10-4** compares the results of the 2071-2100 time period to the historical values of 1961-1990 for both climate scenarios presented.

Table 10-4: Comparison of 2071-2100 Against 1961-1990 for SSP5-8.5 and SSP2-4.5 Scenarios

Climate Parameter	Variable Name	SSP5-8.5		SSP2-4.5	
		Delta	Percent Difference	Delta	Percent Difference
Mean Temperature (°C)	Annual	6.7	65%	4.3	48%
	Winter	7.7	395%	5.3	168%
	Spring	6.3	73%	4.1	54%
	Summer	6.7	30%	4.1	20%
	Fall	6.5	54%	4.0	37%
Maximum Temperature (°C)	Annual	6.6	43%	4.2	30%
	Winter	6.7	432%	4.6	920%
	Spring	6.5	47%	4.3	33%
	Summer	7.0	25%	4.4	16%
	Fall	6.7	40%	4.2	27%
	Annual	6.8	128%	4.3	106%

Minimum Temperature (°C)	Winter	8.7	160%	6.1	90%
	Spring	6.1	182%	3.9	173%
	Summer	6.5	40%	3.9	26%
	Fall	6.4	90%	4.0	68%
Total Precipitation (mm)	Annual	128.6	15%	94.9	11%
	Winter	54.4	27%	38.6	20%
	Spring	48.3	22%	35.9	17%
	Summer	1.9	1%	5.0	2%
	Fall	22.7	10%	14.0	6%
Extreme Precipitation	Max Precipitation in 1 day (mm)	8.9	22%	6.4	16%
	Max Precipitation in 3 days (mm)	13.3	22%	8.9	15%
	Simple Daily Intensity Index (SDII) (mm/day)	0.8	15%	0.5	10%
	95 th Percentile Precipitation (mm)	2.0	16%	1.3	11%

By the results presented in the summary tables, the Humber River Watershed can expect to see increases in temperature through each season. This would include increases to the minimum, mean, and maximum temperatures. Temperature increases can lead to greater evaporation and transpiration, influencing the existing hydrological cycle. As well, warmer temperatures in the winter may imply an increase to snowmelt rates and seasonal surface flows as a result.

Both climate scenarios see increases to total precipitation, particularly in the spring and winter. The SSP5-8.5 and SSP2-4.5 climate scenarios for 2071-2100 show increase in annual precipitation by approximately 129 mm and 95 mm, respectively. This ranges from 11 – 15 % different from the historical climate parameter values for 1960-1990. Increases to the intensity of precipitation is noted under the extreme precipitation climate parameter. Increases to the maximum 1-day and 3-day precipitation events range from 6 mm to 13 mm between both climate scenarios relative to the 1960-1990 historical values. The modelled results for 2071-2100 show that maximum 1-day and 3-day precipitation may increase to as high as 67 mm.

Increased precipitation would lead to increased runoff, placing additional stress on to the stormwater management systems in place. Additionally, more intensity in precipitation events

generally may cause additional risk for urban flooding due to greater rates of runoff from intense storms. Increased urban runoff may be associated with a decline in surface water quality, due to additional runoff from roads and agricultural lands.

It should be noted that the *Downstream Analysis Report* and *Floodplain Analysis Report* document the Regional (Hazel) Storm's impacts to site hydrology (**Appendix A.5.1 and A.3.3**, respectively). The Regional Storm describes a storm where approximately 206 mm of precipitation falls over a 12-hour time frame. Impacts to the climate of the Humber River Watershed are documented by TRCA and summarized within **Table 10-2** and **Table 10-3**. Impacts to site hydrology, with respect to stormwater management and flood protection, are to be monitored and assessed as further information and guidance is made available.

11.0 Municipal Servicing

11.1 Water Supply Infrastructure

The proposed water supply plan for the Subject Site is documented within Section 3.0 of the FSR provided under **Appendix A.5.2**. This includes preliminary fire and peak daily water demand calculations, preliminary layout of the internal water supply systems and external connection points, and alignment with the Region of Peel Water and Wastewater Master Plan. Currently, Peel Region is in the process of updating its master plan study to accommodate growth up to 2051, which is anticipated to be completed in 2026. As per Region of Peel's Water Development Charges 2025, following water supply infrastructure is expected to be within the vicinity of the subject site at the time of construction:

- 400mmØ watermain on Healey Road (Anticipated Construction Year - 2027)
- 600mmØ watermain on The Gore Road, between Highway 413 and Healey Road (Anticipated Construction Year - 2027)
- 900mmØ transmission main on Healey Rd

A network of watermains is proposed to service the units within the subject site, which will then connect to the future 400mmØ and 600mmØ watermains along Healey Road and The Gore Road respectively. Please note, the future watermains along The Gore Road and Healey Road are currently in the 30% Design Phase. It is our understanding that these watermains will be in operation by the year 2027. Further coordination with Peel Region will be needed to provide the latest timeline updates for these projects.

The water supply demands are presented in **Table 11-1**. Please note that pressures within the watermains will be verified via hydrant tests once the infrastructure is constructed. Supporting calculations can be found in **Appendix B** of the FSSR Report (**Appendix A.5.2**).

Table 11-1: Total Water Supply Servicing Demands

Land Use	Expected Population	Average Demand (L/s)	Peak Hour Demand (L/s)	Maximum Day Demand (L/s)	Fire Flow (L/s)	Max Demand + Fire Flow (L/s)
9.8m Single Detached	538	1.74	3.49	5.23	133	136.82
6.85m Semi Detached	1,806	5.85	11.71	17.56	133	145.04
7.62m Street Townhouse	942	3.05	6.11	9.16	200	206.11
Park	75	0.26	0.36	0.78	-	0.36
Total	3,361	10.91	21.66	32.73	-	221.66

The required fire flow demands for the subject site were determined based on *Table 7* and *Table 8* of the FUS (2020) guidelines for one/two family dwellings and row housing. Therefore, the required fire flow for the proposed single and semi-detached houses in the subject site is 133 L/s, and fire flow for the proposed townhouses is 200 L/s. Note, the required fire flow demands can be re-assessed at a later stage upon confirmation of floor areas and unit designs.

11.2 Sanitary Infrastructure

The proposed sanitary servicing plan for the Subject Site is documented within Section 4.0 of the FSSR provided under **Appendix A.5.2**. This includes preliminary sanitary flow calculations,

design and layout of servicing systems, alignment with the Region of Peel Water and Wastewater Master Plan, and alignment with planned capital projects.

The proposed lots will be serviced by sewers running along internal roadways. It is proposed to discharge the sanitary flows to the proposed 525 mm sanitary sewer on Healey Road, extending toward Humber Station Road. Please note, the proposed sanitary sewer along Healey Road is currently in the 30% Design Phase. It is our understanding that this sanitary sewer will be in operation by the year 2027. Further coordination with Peel Region will be needed to provide the latest timeline and sanitary sewer sizing updates for these projects. **Table 11-2** presents the sanitary servicing demands.

Table 11-2: Sanitary Servicing Demands

Area (ha)*	Expected Population	Average Flow (L/s)	Harmon’s Peaking Factor (L/s)	Peak Flow (L/s)	Infiltration (L/s)	Total Flow (L/s)
35.67	3,361	11.26	3.40	38.30	9.27	47.57

*Total Developable Area = Total site area (39.41ha) – NHS (3.74ha)

The final design of the internal sanitary sewers will be confirmed during the detailed design stage.

11.3 Grading

A grading plan has been prepared and is provided under **Appendix B.3**. The grading plan is based on the draft plan prepared by KLM Planning (**Appendix A.7**). The grading plan shows road centerline grades every 20 m. The elevations of the road centerlines were established to provide sufficient cover for the underground storm, sanitary and clean water collector sewers. The retaining wall adjacent to the SWM pond and areas requiring 3:1 slope grading have also been identified on the plan.

Phase 3 – Management, Implementation and Monitoring

Phase 3 of the study builds upon the findings and recommendations established in Phase 2, with a focus on the practical implementation of the preferred land use scenario and associated infrastructure, environmental, and servicing strategies. This phase translates high-level land use and environmental objectives into actionable steps that support a phased, coordinated, and sustainable development approach.

The primary purpose of this phase is to guide the management and implementation of the various development considerations, and also the monitoring program as it pertains to the development, and ensure compliance with applicable criteria and/or policies, which protect the natural environment, and accommodate the anticipated growth of the Mount Hope area.

This phase addresses key technical, environmental, and planning considerations necessary to support the transition from concept planning to draft plan of subdivision applications and eventual construction. This integrated and holistic approach ensures that the environmental and sustainability needs are balanced with infrastructure and community needs. The detailed subsections that follow provide discipline-specific strategies, recommendations, and requirements to guide the next stages of the development.

12.0 Management and Implementation

12.1 Stormwater Management

The following section presents the stormwater management (SWM) strategy for the proposed development on the Subject Lands which has been prepared as part of the Phase 3 study. It will discuss the proposed storm servicing plan including the end-of-pipe SWM facilities as well as the LID measures that will service the Subject Lands. The SWM strategy will demonstrate conformance with all applicable SWM criteria identified as part of the Phase 1 study. Detailed information including relevant calculations and modelling is provided as part of the Functional Servicing and Stormwater Management Report (FSSR) which is included in **Appendix A.5.2**.

12.1.1 Stormwater Management Strategy

A dual drainage SWM scheme is proposed. The minor system, consisting of storm sewers, will be designed to capture and convey 10-year flows, while the major system, consisting of overland flow routes (i.e., ROWs), will handle excess flows beyond the 10-year event. The minor and major system shall be designed to the satisfaction of the Town of Caledon and will safely convey flows to the downstream SWM facility.

The one (1) SWM facility is proposed to be a wet pond. The pond shall provide the required quality, quantity, and erosion control (extended detention), consistent with the previously established SWM criteria, for a majority of the Subject Lands. The pond will also provide filtration via filter beds to satisfy CLI-ECA volume control requirements. This will be in conjunction with lot-level controls which will provide retention. A portion of the site will also drain uncontrolled due to grading constraints consisting primarily of backyard areas. Please see the FSSR (**Appendix A.5.2**) for the storm drainage plan and storm servicing plan respectively. Preliminary SWM pond drawings are included in **Appendix B.3**.

Table 12-1 summarizes the post-development drainage areas, imperviousness values, and outlet location. **Table 12-2** summarizes the required active storage volume for the pond to meet quantity control criteria. **Table 12-3** summarizes the required permanent pool volume for the pond to meet quality control criteria. **Table 12-4** summarizes the erosion control measures.

LID measures are intended to mimic the pre-development hydrology of the development by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source. For this development, infiltration trenches are proposed in backyards to provide retention. The trenches will collect drainage from backyards and roofs. These will serve a dual purpose, helping satisfy both water balance and CLI-ECA volume control criteria. Alternative LID measures may be explored as the development process progresses, provided that infiltration and retention targets are satisfied. More details on the LID plan can be found in the FSSR (**Appendix A.5.2**).

Table 12-1: Post-Development Drainage Areas

Catchment	Area (ha)	Imperviousness (%)	Outlet
SWM Pond	31.71	74	West Humber River Tributary

Table 12-2: Active Storage Requirements

Catchment	Area (ha)	Required Volume (m ³)	Comments
SWM Pond	31.71	46,000	Regional Storm Volume

Table 12-3: Permanent Pool Requirements

Catchment	Area (ha)	Required Volume (m ³)	Target
SWM Pond	31.71	3,023	70% TSS removal

Table 12-4: Erosion Control Summary

Catchment	Area (ha)	Detention Target	Detention Volume (m ³)
SWM Pond	31.71	25mm, 48hours	5,823

To support efficient land use planning and as discussed with the Town, a portion of the park block is proposed to function as a dry pond to satisfy stormwater storage requirements. The park area is designed to provide storage for the 100-year and regional storm events only, with a drawdown time of less than 24 hours to ensure temporary ponding during these major events.

12.1.2 Water Balance

A water balance is an accounting of the water resources within a given area. As a concept, the water balance is relatively simple and may be estimated from the following equation:

$$P = S + ET + R + I \quad \text{where: } P = \text{precipitation}$$

$$S = \text{change in groundwater storage}$$

$$ET = \text{evapotranspiration/evaporation}$$

R = surface water runoff
I = infiltration

The subject site is not located within the Well Head Protection Area (WHPA). Best efforts to match the pre-development annual infiltration volume will be done in post-development conditions.

The TRCA water budget tool was used in the water balance analysis, which provides the annual precipitation rate for the Subject Lands. As the TRCA water budget tool inputs do not equal outputs, the evapotranspiration rate was determined based on prorating the precipitation rate. The infiltration factor for the underlying soil (silty clay till) was determined based on Table 3.1 of the Stormwater Management Planning and Design Manual (MOE 2003), and was applied to the water surplus (i.e., the difference between the precipitation and evapotranspiration rates) to determine the infiltration and runoff rates for pre-development conditions and pervious areas in the post-development conditions. The following table summarizes the water balance component values used for existing conditions.

Table 12-5: Water Balance Parameters

Water Balance Component	Value (mm/yr)
Precipitation	865
Evapotranspiration	560
Water Surplus	305
Infiltration	137
Runoff	168

The water balance analysis was done for three scenarios. (1) pre-development conditions, (2) post-development conditions with no mitigation and (3) post-development conditions with mitigation. The infiltration component was evaluated for each scenario to determine the infiltration deficit and required infiltration volume to eliminate the deficit.

Based on the water balance assessment, it was determined that the annual infiltration volume for pre-development conditions is approximately 54,090 m³/year and is expected to drop to 24,907

m³/year under the post-development conditions without mitigation. Thus, the approximate annual infiltration deficit without mitigation is calculated to be 29,183 m³/year.

In order to mitigate the estimated infiltration deficit, proposed mitigation methods include infiltration trenches in the rear yard of residential lots to infiltrate clean runoff from roof areas and rear yards. For the lots with infiltration trenches, half of the roofs and rear yards will be conveyed to the infiltration trenches. Given that silty clay till is present in underlying soils, a conservative design infiltration rate of 15 mm/hour was assumed with a calculated drawdown time of 48 hours.

The post-development conditions with the proposed subject site mitigation methods will produce 166,674 m³/year of surface runoff, 54,206 m³/year of infiltration, and 120,015 m³/year of evapotranspiration. The infiltration volume provided from the site plans and infiltration trenches will satisfy the pre to post infiltration deficit.

The following table summarizes the complete water balance analysis for all scenarios. The proponent may also investigate alternative LIDs at the draft plan stage. Detailed water balance calculations are provided in the FSSR under **Appendix A.5.2**.

Table 12-6: Water Balance Summary

Parameter	Pre-Development	Post-Development (w/o Mitigation)	Change (Pre to Post)	Post-Development (w/Mitigation)	Change (Pre to Post)
Inputs (m³/year)					
Precipitation	340,897	340,896	0%	340,896	0%
Inputs	340,897	340,896	0%	340,896	0%
Outputs (m³/year)					
Precipitation	120,201	220,881	84%	220,881	84%
Surplus	120,201	220,881	84%	220,881	84%
Evapotranspiration	220,696	120,015	-46%	120,015	-46%
Infiltration	54,090	24,907	-54%	54,206	0%
Runoff	66,110	195,974	196%	166,674	152%

Outputs	340,897	340,896	0%	340,896	0%
---------	---------	---------	----	---------	----

12.1.3 CLI-ECA Requirements

The new CLI-ECA program includes a 27 mm retention requirement for stormwater management, which can be achieved through a hierarchical approach to provide flexibility in the implementation of measures to meet the runoff volume target. The runoff volume control target hierarchy has the following order:

- Control hierarchy priority 1 (Retention),
- Control hierarchy priority 2 (LID filtration), and
- Control hierarchy priority 3 (Conventional Treatment).

Due to the underlying silty clay till with poor infiltration capacity, centralized or sub-surface infiltration measures to meet a specific volume target are unsuitable for this development. As such, to satisfy the CLI-ECA requirement for 27 mm of runoff volume control, a filter bed is proposed within the SWM pond to provide treatment for the 27 mm storm event. While the native soils exhibit low permeability, passive infiltration measures have been incorporated within the development as a best-effort approach. Shallow infiltration trenches are proposed on the majority of the lots. The proposed infiltration trenches are not intended to meet infiltration mandates as the site is not within a Wellhead Protection Area and Significant Groundwater Recharge Area, but prioritizes maximizing water balance benefits to practical extent.

The filter bed will be located downstream of the SWM pond and will function as the third treatment cell within the integrated stormwater management facility. Final filter bed sizing and configuration will be confirmed during the detailed design stage.

Table 12-7: CLI-ECA Summary

Overall Volume Control Parameter	Value
Drainage Area	31.71 ha
Imperviousness	74%
Required Volume	6,336 m³

Infiltration Trenches Volume	824 m ³
Pond Filter Bed Volume	6,336 m ³
Total Provided Volume	7,160 m³

12.2 Groundwater

Groundwater recommendations based on the Preliminary Lotting Concept Plan dated January 30, 2026, by KLM Planning Partners, during construction to mitigate impacts to local groundwater resources resulting from dewatering is presented in the report titled “*Hydrogeological Assessment for Proposed Residential Development, 12879 The Gore Road, Town of Caledon*”, Reference Number: 2405-W038, Rev.1, dated March 3, 2026, prepared by Soil Engineers Ltd. The recommendations presented in the above mentioned report should be revised once the detailed design becomes available.

12.3 Construction

Construction (i.e. grading, planting, etc.) on site is subject to applicable wildlife seasonal timing windows, as discussed in Sections 7.5 and 7.6 of this report. These timing windows are summarized below:

- Breeding birds: to avoid contravention of the *Migratory Birds Convention Act*, vegetation removal and earthworks will avoid the breeding bird window of March 30 to August 30. However, if these activities are proposed within that window, a qualified ecologist should complete a nest sweep survey a maximum of 48 hours before vegetation removal and earthworks; and
- SAR bats: to avoid contravention of the ESA, tree removal will avoid the SAR bat roosting window of March 15 to November 30. However, if tree removals are proposed within that window, a qualified ecologist should complete a bat exit survey a maximum of 24 hours before tree removal.
- In-water work: To avoid impacts on fish during sensitive life stages, in-water works should be avoided between March 15 and July 1, unless otherwise approved by DFO.

It should be noted that construction of the municipal services (external water/sanitary infrastructure) is proposed to be completed in the 2027-2029 timeframe.

13.0 Monitoring Plan

The following sections provide the proposed natural heritage monitoring approach based on the conceptual restoration and enhancement strategy outlined in **Section 8.4**. As this plan has been developed based on the conceptual strategy, this monitoring plan is considered preliminary and may be updated as part of the detailed Restoration and Enhancement Design Brief to reflect the finalized restoration and enhancement strategy. This plan defines the ecological performance indicators, the scope and frequency of monitoring, and the reporting requirements to assess restoration success over time. The monitoring strategy has been developed with broad climate change considerations in mind to support long-term ecological resilience under changing environmental conditions.

13.1 Ecological Performance Indicators

Ecological monitoring indicators are specific, quantifiable measures of attributes that connect short term and long-term goals (Gann et al. 2019). The proposed monitoring program includes the following indicators:

- Short term (within 5 years):
 - Successful establishment of planted and seeded native vegetation within restoration areas, including achievement of target survival and cover thresholds;
 - Early detection of invasive plant species and implementation of the Adaptive Management Plan, if required, to control highly invasive species (Category 1 in accordance with Urban Forest Associates, 2002); and

- Verification that constructed wetland and channel features exhibit the intended hydrological conditions, as inferred from vegetation community composition and structural indicators.
- Long-term:
 - Improved diversity and abundance of habitats and microhabitats within the Subject Lands;
 - Improved diversity, abundance, and structural complexity of wetland and meadow vegetation communities within the Subject Lands;
 - Improved diversity and abundance of breeding bird species within the Subject Lands; and
 - Improved diversity and quality of aquatic habitat.

13.2 Monitoring Scope and Timeline

The proposed monitoring program includes baseline, compliance, and performance monitoring. Together, these components support evaluation of the effectiveness of the restoration and enhancement measures over time. The purpose of each monitoring component is as follows:

- Baseline Monitoring – Baseline monitoring is undertaken to characterize the condition, significance, and function of existing natural heritage systems and to establish reference conditions for comparison with post-development conditions. This monitoring is conducted prior to development and was completed by GEI between 2022 and 2025.
- Construction-Phase Compliance Monitoring – Construction-phase compliance monitoring is intended to assess the effectiveness of mitigation measures and construction practices implemented to manage potential impacts during construction. This monitoring is typically driven by permit and approval requirements and focuses on confirming that ESC measures

and other construction related mitigative approaches are installed, maintained, and functioning as intended.

- Post-Development Monitoring – Post-development monitoring includes both compliance and performance monitoring components:
 - Compliance Monitoring – Compliance monitoring is undertaken to satisfy permit and approval requirements and to confirm that components of the NHS enhancement areas have been constructed in accordance with approved designs. This includes monitoring of restoration areas and enhanced vegetated buffers.
 - Performance Monitoring – Performance monitoring evaluates the functionality and effectiveness of the NHS as a whole. This form of monitoring is typically conducted at a broader spatial scale than compliance monitoring and may be comparable in scope to the baseline monitoring to support assessment of longer-term ecological outcomes. This includes monitoring of retained natural features, restoration areas, and enhanced vegetated buffers.

13.2.1 Baseline Monitoring

Baseline monitoring is required to characterize and confirm the significance and function of existing natural heritage systems and to establish reference conditions for comparison with future conditions. Baseline monitoring was completed by GEI between 2022 and 2025, as described in **Section 2.3.2**, and included the following components:

- A three-season botanical inventory;
- Ecological Land Classification (ELC);
- A Stem Density Assessment;
- Breeding Bird Surveys;

- Bat Habitat Assessment;
- Amphibian Call Count Surveys;
- Snake Visual Encounter Surveys;
- Terrestrial Crayfish Surveys;
- An AHA;
- HDFA; and
- Fish Community Sampling

Baseline data will be used to support comparative assessments over time, to identify and interpret ecological changes, and to evaluate the effectiveness of implemented mitigation and restoration measures.

13.2.2 Construction-Phase Compliance Monitoring

The purpose of compliance monitoring during construction is to verify that ecological mitigation measures are implemented as required and that construction-related impacts are effectively managed. Compliance monitoring will also confirm that approved restoration plans are carried out in accordance with design intent. Construction-related monitoring requirements, including ESC measures, tree protection zone requirements, and spill prevention and response measures, will be implemented by the general contractor and/or landscape contractor. Vegetation monitoring of plantings within the restoration areas will be undertaken by a qualified ecologist, botanist, and/or the project Landscape Architect. The specific compliance monitoring components are described further in the subsections below.

13.2.2.1 Landscape Architecture Construction Administration

It is recommended that the project LA conduct the following site visits and inspections:

- A pre-construction and mobilization meeting on site with the contractor to review site protocols and confirm material delivery and construction schedules;
- Attendance at construction review meetings, including:
 - Inspection and confirmation of fine grading adjacent to natural areas;
 - Progress reviews to verify that grading conforms to approved designs; and
- A substantial completion site inspection with the Town of Caledon and/or TRCA, as applicable, to confirm that a minimum of 90% of the landscape installation has been completed.

13.2.2.2 Vegetation Monitoring of Plantings

During the construction-phase compliance monitoring period, vegetation monitoring of plantings within the restoration areas will include the following review activities by a qualified ecologist, botanist, and/or the project Landscape Architect:

- Any native species substitutions and/or stock size adjustments to confirm suitability for site conditions and consistency with restoration goals;
 - Plant materials delivered to the site, or seed tickets where seeding is proposed, to confirm species composition and suitability prior to installation;
 - Planting bed preparation, mulching, and soil amendments, as applicable, to confirm appropriate implementation relative to approved restoration plans and site conditions;
 - Planting layouts prior to and following installation to confirm consistency with approved restoration plans and appropriate field fitting in response to site conditions;
 - Planting numbers and densities to confirm consistency with approved restoration plans;
 - Installation of specialized wildlife habitat features to confirm appropriate placement and configuration; and
 - Identification of aggressive invasive species (Category 1) that may affect the successful
-

establishment of native vegetation within restoration areas.

13.2.2.3 Tree Protection Zone Monitoring

Monitoring of tree protection zones (where required based on the results of the Arborist assessment) is recommended during construction. This monitoring is recommended to be conducted or supervised by the general contractor and/or the landscape contractor to confirm adherence to approved tree protection requirements. Monitoring activities will be carried out in accordance with the Arborist Report (Cosburn Nauboris 2025) and will include observation of potential construction-related impacts to trees, including soil compaction, root disturbance, mechanical damage, and required pruning.

13.2.2.4 Erosion and Sediment Control Monitoring

Monitoring of ESC measures during construction should occur throughout the construction period. ESC measures will be implemented and maintained throughout construction and will remain in place until a minimum of 80% site stability has been achieved. The general contractor and/or landscape contractor will undertake required maintenance activities to maintain effective erosion and sediment control on site.

13.2.2.5 Migratory Bird Timing Restrictions

In accordance with the *Migratory Birds Convention Act*, the proponent is responsible for ensuring that no active bird nests are present within the work area prior to the start of construction. To comply with the *Migratory Birds Convention Act*, tree and other vegetation removals as well as earth-moving activities should occur outside the breeding bird timing window (March 31 to August 31). If these activities are planned within the breeding bird timing window, a qualified ecologist should conduct a nest sweep survey no more than 48 hours prior to tree and other vegetation removal as well as ground-disturbing activities. This survey will confirm whether construction can proceed without impacting migratory birds or their nests.

13.2.2.6 Species at Risk Bat Timing Restrictions

To comply with the *Endangered Species Act*, tree removal should occur outside the SAR bat roosting timing window (March 15 to November 30). If tree removals outside the significant woodland are planned within the SAR bat roosting timing window, a qualified ecologist should conduct two rounds of bat exit surveys on two consecutive nights, with the second round no more than 24 hours prior to tree removal. This survey will confirm whether tree removal can proceed without impacting SAR bat roosting.

13.2.3 Post-Development Monitoring

Post-development monitoring will include both compliance and performance monitoring components. Compliance monitoring will be undertaken to satisfy permit and approval requirements and to confirm that components of the NHS enhancement areas have been constructed in accordance with approved designs. Performance monitoring will evaluate the functionality and effectiveness of the NHS as a whole and will focus on longer-term ecological outcomes. Performance monitoring will be conducted at a broader spatial scale than compliance monitoring and may include both retained and restoration areas of the NHS. The specific compliance and performance monitoring components are described further in the subsections below.

13.2.3.1 Compliance Monitoring

Compliance monitoring of plant survivorship within the restoration areas will be conducted in Years 1 and 2 following planting, commencing in the year following the substantial completion site inspection, which is conducted once a minimum of 90% of the landscape installation has been completed. Compliance monitoring will be coordinated through the project Landscape Architect and will focus on plant establishment, survivorship, coverage, and growth.

Appropriate tree and shrub survivorship targets will be applied (as determined during the detailed design process). For areas seeded with native groundcover, germination success is not

typically quantified due to the inherent variability associated with seed establishment; however, areas exhibiting visibly low herbaceous cover will be identified during monitoring.

Planting installation deficiencies, plant mortality requiring replacement under the applicable warranty period, and seeding deficiencies will be documented and communicated to the appropriate project lead for corrective action. Corrective measures may include replacement planting and re-seeding, as appropriate, to promote consistent vegetation cover across restoration areas and to achieve the restoration design objectives.

13.2.3.2 Performance Monitoring

Post-construction performance monitoring will be undertaken to evaluate the functionality of the restored and retained natural areas relative to baseline conditions documented in 2022 and 2024. A five-year monitoring program is recommended, with monitoring conducted in Years 1, 3, and 5, commencing the growing season following implementation of vegetation and other restoration measures. The following ecological performance monitoring surveys will be completed during each monitoring year:

- Vegetation surveys:
 - ELC (summer);
 - Botanical inventory (summer);
 - Invasive species surveys (summer);
- Breeding bird surveys (two rounds);
- Calling amphibian surveys (three rounds); and
- Fish community and fish habitat surveys (in realigned watercourse).

Survey methodologies will be consistent with those used for baseline monitoring, as described in **Section 2.3.2**. Survey locations will be refined based on the finalized restoration and compensation

plan.

For the realigned watercourse, a targeted fluvial geomorphology monitoring program will be implemented to assess channel stability and function. Monitoring will occur bi-annually (spring and fall) for three years post-construction, with possible biennial monitoring beyond that period if needed. This program includes baseline and follow-up surveys of the longitudinal profile and cross-sections, erosion pin measurements, photo documentation, bed material characterization, and general vegetation assessments. These efforts will help determine whether remedial works are required and support adaptive management of the restored corridor.

13.3 Monitoring Reports

Monitoring reports will be prepared for each performance monitoring year (i.e., Years 1 and 2) to summarize monitoring results, compare pre- and post-development ecological conditions, and assess the NHS relative to the ecological performance indicators outlined in **Section 15.1**. Where monitoring results indicate that adaptive management is warranted, consistent with the adaptive management triggers described in **Section 16**, the reports will recommend appropriate measures. Monitoring reports will be submitted to the Town and/or TRCA, as required, by March 1 of the calendar year following each monitoring year.

14.0 Adaptive Management Plan

14.1 Natural Heritage

Adaptive management provides a structured, responsive process that supports the restoration objectives. It allows for timely corrective action if monitoring identifies unanticipated impacts or deficiencies in restoration success. This adaptive management framework outlines the key triggers that would initiate adaptive management and provides example response actions to guide future decision-making. If required, an adaptive management plan will be included within the performance monitoring reports outlining the site-specific triggers, corresponding management actions, and implementation timelines. Adaptive management measures may include additional

vegetation plantings, invasive species control, or strategies to address human encroachment.

14.1.1 Woody Species Survivorship

If the planted woody species survivorship does not meet the targets, the causes of planting failure will be investigated and documented. Recommendations for replanting will be provided within the warranty period, and, if appropriate, additional measures will be recommended to remediate site conditions contributing to planting failure.

14.1.2 Invasive Species

Early detection monitoring will focus on the overall percent cover of individual Category 1 invasive plant species. In general, 5% or less overall cover by any single Category 1 invasive plant species is considered acceptable. Greater than 5% cover by any single Category 1 invasive plant species is considered an exceedance and will trigger the preparation of an adaptive management plan to assess the species' extent and risk of further spread, and to determine appropriate control measures. Where required, management of the species should continue for a specified duration or until further monitoring confirms that it has been adequately controlled.

14.1.3 Human Encroachment

If human encroachment is detected within the restoration area, this will trigger the preparation of an adaptive management plan. Management actions will vary according to the type and extent of encroachment but could include restoration of disturbed areas, establishment of deterrent barriers or plantings, and installation of educational signage. Where required, the effectiveness of the management actions should be assessed through further monitoring, with further adjustments as needed if human encroachment persists.

15.0 Future Study Requirements

The TOR identified multiple studies that would be provided as part of the development process. **Table 15-1** lists these reports and their respective statuses.

Table 15-1: Supporting Studies

Document	Status
Environmental Impact Study (EIS) incl. establishing the limits of development.	EIS scope covered in this LSS report.
Geotechnical Study (incl. Slope Stability)	To be provided as an appendix of this LSS report.
Hydrogeological and Water Balance Study (HWBS)	To be provided as an appendix of this LSS report.
Functional Servicing and Stormwater Management Report (FSSR)	Provided as an appendix of this LSS report.
Detailed Erosion Assessment	To be provided as an appendix of this LSS report.
Feature-Based Water Balance (FBWB) Assessment	Discussed in this report – Section 6.2.

16.0 Conclusion

The Healey Gore subject area, referred to as the “Subject Lands”, is a proposed residential subdivision in Caledon located west Gore Road and south of Healey Road. A Secondary Plan and Draft Plan of Subdivision are being completed concurrently.

The study components are organized into three phases, per the Town’s (2024) *Terms of Reference: Local Subwatershed Studies* (LSS TOR). The results of each phase are outlined in this document. In correspondence with the Town of Caledon and the Toronto and Region Conservation Authority (TRCA), it was agreed to conduct a Local subwatershed Study (LSS) for the Subject Lands alone, pertinent to its Draft Plan for subdivision.

The purpose of the LSS is to create a sustainable development plan for the Subject Lands in Caledon by protecting and enhancing the natural and human environments by implementing the direction, targets, criteria and guidance of the Region of Peel’s Scoped Subwatershed Study (SSS) (Wood et al. 2022). The LSS has been prepared in such a way that it can be used as a Functional Servicing & Stormwater Management Report (along with associated appendices and studies that provide further details than those mentioned in this report) for the Draft Plan of Subdivision stage.

17.0 References

- Bird Studies Canada. 2009. Marsh Monitoring Program: Participant's Handbook for Surveying Amphibians. Published in cooperation with Environment Canada and the U.S. Environmental Protection Agency. 13 pp.
- Blancher, P. 2013. Estimated number of birds killed by house cats (*Felis catus*) in Canada. *Avian Conservation and Ecology*, 8(2): 3.
- Brouillet, L., F. Coursol, S.J. Meades, M. Favreau, M. Anions, P. Bélisle, and P. Desmet. 2010+. VASCAN, the Database of Vascular Plants of Canada [Database]. Available online: <http://data.canadensys.net/vascan/search/>
- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (Eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001–2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. xxii + 706 pp.
- Cadman, M.D., H.J. Dewar, and D.A. Welsh. 1998. The Ontario Forest Bird Monitoring Program (1987–1997): Goals, methods and species trends observed. Technical Report Series No. 325, Canadian Wildlife Service.
- California Academy of Sciences and National Geographic Society. 2026. iNaturalist [Database]. Available online: <https://www.inaturalist.org>.
- Chapman, L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario, 3rd Edition. Geological Survey of Ontario. 270 pp.
- Cosburn Nauboris Ltd. 2025. Arborist Report Humber Station West. 41 pp.
- Credit Valley Conservation (CVC). 2015. Fluvial Geomorphic Guidelines. Prepared for Credit Valley Conservation. Available online: https://files.cvc.ca/cvc/uploads/2021/06/CVC-Fluvial-G-Guide_April-2015_na.pdf
- CVC and TRCA. 2014. Evaluation, Classification and Management of HDFs Guidelines. Credit Valley Conservation and Toronto and Region Conservation Authority. 26 pp. Available online: <https://files.cvc.ca/cvc/uploads/2014/02/HDFA-final.pdf>
- DFO. 2019a. Fish and Fish Habitat Protection Policy Statement, August 2019. Fisheries and Oceans
-

- Canada. 36 pp.
- DFO. 2019b. Fish and Fish Habitat Protection Program, August 2019. Request a Review of Your Project Near Water: Step 3. Check if Your Project Needs A Review. Fisheries and Oceans Canada. Available online: <http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-003-eng.html>
- DFO. 2024. Recovery Strategy and Action Plan for the Redside Dace (*Clinostomus elongatus*) in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. Vi + 110 pp.
- DFO. 2025. Aquatic Species at Risk Map [Database]. Fisheries and Oceans Canada. Available online: <http://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html>
- Downs, P.W. 1995. Estimating the probability of river channel adjustment. *Earth Surface Processes and Landforms*, 20: 687-705. Available online: <https://onlinelibrary.wiley.com/doi/abs/10.1002/esp.3290200710>
- eBird. 2024. eBird: An online database of bird distribution and abundance [Database]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available online: <http://www.ebird.org>
- Fischenich, C. 2001. Stability Thresholds for Stream Restoration Materials. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29), U.S. Army Engineer Research and Development Center, Vicksburg, MS. Available online: <https://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf>
- Foxcroft, L.C., P. Pysek, D.M. Richardson, and P. Genovesi (Eds.). 2013. *Plant Invasions in Protected Areas*. Springer Series in Invasion Ecology, Vol. 7. xxii + 656 pp.
- Galli, J. 1996. *Rapid Stream Assessment Technique, Field Methods*. Metropolitan Washington Council of Governments.
- García-Ruiz, J. M., Regüés, D., Alvera, B., Lana-Renault, N., Serrano-Muela, P., Nadal-Romero, E., & Arnáez, J. 2008. Flood generation and sediment transport in experimental catchments affected by land use changes in the central Pyrenees. *Journal of Hydrology*, 356(1-2), 245-260. Available online: <https://digital.csic.es/handle/10261/97586>
-

-
- Government of Canada. 1985. Fisheries Act, R.S.C., 1985, c. F-14 (Amended 2019).
- Government of Canada. 1994. Migratory Birds Convention Act, S.C. 1994, c. 22 (Amended 2017).
- Government of Ontario. 1990. Conservation Authorities Act, R.S.O. 1990, c. C.27 (Consolidated 2024).
- Government of Ontario. 1990. Planning Act, R.S.O. 1990, c. P.13. (Consolidated 2024).
- Government of Ontario. 2007. Endangered Species Act, S.O. 2007, c. 6 (Consolidated 2024).
- Government of Ontario. 2008. Ontario Regulation 230/08: Species at Risk in Ontario List. Under Endangered Species Act, S.O. 2007, c. 6 (Consolidated 2024).
- Government of Ontario. 2024. Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits. Under Conservation Authorities Act, R.S.O. 1990, c. C.27 (Consolidated 2024).
- Hey, R. D. and Thorne, C. R. 1986. Stable channels with mobile gravel beds. *Journal of Hydraulic Engineering*, American Society of Civil Engineers 112: 671-689. Volume 112, Issue 8. Available online: [https://doi.org/10.1061/\(ASCE\)0733-9429\(1986\)112:8\(671\)](https://doi.org/10.1061/(ASCE)0733-9429(1986)112:8(671))
- Julien, P. Y. 1994. *Erosion and Sedimentation* (1st ed.). Cambridge University Press.
- Knop, E., L. Zoller, R. Ryser, C. Gerpe, M. Horler, and C. Fontaine. 2017. Artificial lighting at night as a new threat to pollination. *Nature*, 548(1): 206–209 pp.
- Komar, P.D. 1987. Selective gravel entrainment and the empirical evaluation of flow competence. *Sedimentology*, 34: 1165-1176. Available online: <https://doi.org/10.1111/j.1365-3091.1987.tb00599.x>
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. 225 pp.
- Longcore, T. and C. Rich. 2004. Ecological light pollution. *Frontiers in Ecology and the Environment*, 2(4): 191–198 pp.
- Loss, S.R., T. Will, and P.P. Marra. 2013. The impact of free-ranging domestic cats on wildlife of the United States. *Nature Communications*, 4(1396): 1–7 pp.
-

- MECP. 2022. Maternity Roost Surveys (Forests/Woodlands). Ministry of Environment, Conservation and Parks. 3 pp.
- Miller, M.C., McCave, I.N. and Komar, P.D. 1977. Threshold of sediment erosion under unidirectional currents. *Sedimentology*, 24: 507-527. Available online: <https://doi.org/10.1111/j.1365-3091.1977.tb00266.x>
- Ministry of the Environment (MOE). 2003. Ontario Ministry of the Environment. Stormwater Management Guidelines.
- Ministry of Natural Resources (MNR). 2002. Technical Guide – River & Stream Systems: Erosion Hazard Limit. Available online: <https://www.scrca.on.ca/wp-content/uploads/2018/09/MNR-Technical-Guide-River-and-Stream-Erosion-Hazard.pdf>
- MMA. 2017. Greenbelt Plan. Ministry of Municipal Affairs. Queen’s Printer for Ontario. 98 pp. Available online: <https://files.ontario.ca/greenbelt-plan-2017-en.pdf>
- MMAH. 2020. A Place to Grow: Growth Plan for the Greater Golden Horseshoe. Ministry of Municipal Affairs. Queen’s Printer for Ontario. Available online: <https://files.ontario.ca/mmah-place-to-grow-office-consolidation-en-2020-08-28.pdf>
- MMAH. 2024. Provincial Planning Statement, 2024: Under the Planning Act. Ministry of Municipal Affairs and Housing. Queen’s Printer for Ontario. 60 pp. Available online: <https://www.ontario.ca/files/2024-10/mmah-provincial-planning-statement-en-2024-10-23.pdf>
- MNR. 2000. Significant Wildlife Habitat Technical Guide. Ministry of Natural Resources, Fish and Wildlife Branch, Wildlife Section, Science Development and Transfer Branch, Southcentral Sciences Section. 151 pp. Available online: <https://www.ontario.ca/document/significant-wildlife-habitat-technical-guide>
- MNR. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Ministry of Natural Resources. Queen’s Printer for Ontario. 248 pp. Available online: <https://docs.ontario.ca/documents/3270/natural-heritage-reference-manual-for-natural.pdf>
- MNR. 2012. Greenbelt Plan 2005: Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area, Technical Paper 1. Ministry of
-

- Natural Resources. Queen's Printer for Ontario. 248 pp. Available online:
<https://files.ontario.ca/mnrf-greenbelt-technical-paper-en-2021-08-16.pdf>
- MNRF. 2015a. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Ministry of Natural Resources and Forestry. Available online: <https://dr6j45jk9xcmk.cloudfront.net/documents/4775/schedule-6e-jan-2015-access-ver-final-s.pdf>
- MNRF. 2015b. Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario. Ministry of Natural Resources and Forestry, Species Conservation Policy Branch. Peterborough, Ontario. ii + 16 pp.
- MNRF. 2022. Ontario Wetland Evaluation System, Southern Manual: 4th Edition. Ministry of Natural Resources and Forestry. King's Printer for Ontario. 247 pp. Available online:
<https://www.ontario.ca/files/2023-02/mnrf-pd-rpdb-ontario-wetlands-evaluation-system-southern-manual-2022-en-2023-02-02.pdf>
- MNRF. 2023. Ontario Watershed Information Tool [Database]. Ministry of Natural Resources and Forestry. Available online:
<https://www.lioapplications.lrc.gov.on.ca/OWIT/index.html?viewer=OWIT.OWIT&locale=en-CA>
- MNRF. 2024. Make A Map: Natural Heritage Areas [Database]. Ministry of Natural Resources and Forestry. Available online:
https://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritageandviewer=NaturalHeritageandlocale=en-US
- Montgomery, D.R. and Buffington, J.M. 1997. Channel-reach morphology in mountain drainage basins. Geological Society of America Bulletin (109), 5: 596-611. Available online:
[https://doi.org/10.1130/0016-7606\(1997\)109<0596:CRMIMD>2.3.CO;2](https://doi.org/10.1130/0016-7606(1997)109<0596:CRMIMD>2.3.CO;2)
- NHIC. 2021. Plant Communities List. Natural Heritage Information Centre, Ministry of Natural Resources and Forestry [Excel Spreadsheet]. Available online: <https://www.ontario.ca/page/get-natural-heritage-information>
- NHIC. 2024. Ontario Species List: All Species. Natural Heritage Information Centre, Ministry of Natural Resources and Forestry [Excel Spreadsheet]. Available online: <https://www.ontario.ca/page/get->
-

[natural-heritage-information](#)

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

Ontario Nature. 2024. Ontario Reptile and Amphibian Atlas [Database]. Available online:

<https://www.ontarioinsects.org/herp/>

Proppe, D.S., C.B. Sturdy, and C.C. St. Clair. 2013. Anthropogenic noise decreases urban songbird diversity and may contribute to homogenization. *Global Change Biology*, 19(4): 1075–1084 pp.

Regional Municipality of Peel. 2022. Region of Peel Official Plan. April 2022 Office Consolidation.

Available online: https://www.peelregion.ca/officialplan/download/_media/region-of-peel-official-plan-april2022.pdf

Richards, C., Haro, R.J., Johnson, L.B. and Host, G.E. 1997. Catchment and reach-scale properties as indicators of macroinvertebrate species traits. *Freshwater Biology*, 37: 219-230. Available

online: <https://experts.umn.edu/en/publications/catchment-and-reach-scale-properties-as-indicators-of-macroinvert>

Stanfield, L. (Ed.). 2017. Ontario Stream Assessment Protocol, Version 10. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 550 pp.

Toronto Entomologists' Association 2024a. Ontario Butterfly Atlas [Database]. Available online:

<https://www.ontarioinsects.org/atlas/index.html>.

Toronto Entomologists' Association. 2024b. Ontario Moth Atlas [Database]. Available online:

<http://www.ontarioinsects.org/moth/>

Town of Caledon. 2025. Future Caledon Official Plan. Available online:

https://ic12.esolg.ca/11187116_TownofCaledon/en/town-services/resources/Business-Planning--Development/Policy/Official-Plan/June-2023-Draft-Official-Plan/June-2023-Draft-Future-Caledon-Official-Plan.pdf

Toronto and Region Conservation Authority (TRCA). 2004. Belt Width Delineation Procedures.

TRCA. 2012. Stormwater Management Criteria. Toronto and Region Conservation Authority. 126 pp.

Available online: <https://traca.s3.ca-central->

- 1.amazonaws.com/app/uploads/2021/10/20103017/SWM-Criteria-2012.pdf
- TRCA. 2014. The Living City: Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority. 204 pp. Available online: https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/10/20155211/2329_TheLivingCityPolicies_rev19_forWeb.pdf
- TRCA. 2017. Wetland Water Balance Risk Evaluation. Toronto and Region Conservation Authority. 52 pp. Available online: https://trca.ca/app/uploads/2017/12/WetlandWaterBalanceRiskEvaluation_Nov2017.pdf
- TRCA. 2019. Erosion and Sediment Control Guide For Urban Construction. Toronto and Region Conservation Authority. 236 pp. Available online: https://sustainabletechnologies.ca/app/uploads/2020/01/ESC-Guide-for-Urban-Construction_FINAL.pdf
- TRCA. 2023. Humber River Watershed Characterization Report. Toronto and Region Conservation Authority. 245 pp. Available online: <https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2023/10/23154227/FINAL-Humber-River-Watershed-Characterization-Report-October-2023.pdf>
- TRCA. 2024. TRCA Regulation Mapping [Database]. Toronto and Region Conservation Authority. Available online: <https://www.arcgis.com/apps/webappviewer/index.html?id=c11f5a41e3cc4ebab6909b1e0831b1d8>
- TRCA. 2025. HRWP Significant Groundwater Recharge Areas [Database]. Toronto and Region Conservation Authority. Available online: <https://trca-camaps.opendata.arcgis.com/datasets/hrwp-significant-groundwater-recharge-areas/explore?location=43.888543%2C-79.771399%2C10.96>
- Urban Forest Associates Inc. 2002. Invasive Exotic Species Ranking for Southern Ontario. 7pp.
- Varga, S., D. Leadbeater, J. Webber, J. Kaiser, B. Crins, J. Kamstra, D. Banville, E. Ashley, G. Miller, C. Kingsley, C. Jacobsen, K. Mewa, L. Tebby, E. Mosley, and E. Zajc. 2005. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora District. 96 pp.

- Villard, P. V. and Parish, J. D. 2003. A Geomorphic-based protocol for assessing stream sensitivity and erosion thresholds: A tool for stormwater management. In 16th Canadian Hydrotechnical Conference. Canadian Society for Civil Engineers, October 22-24, 2003, Burlington, ON, 10 p. Available online: https://www.researchgate.net/publication/334307215_A_GEOMORPHIC-BASED_PROTOCOL_FOR_ASSESSING_STREAM_SENSITIVITY_AND_EROSION_THRESHOLDS_A_TOOL_FOR_STORMWATER_MANAGEMENT
- Ward, A. D. Mecklenberg, J. Mathews, and D. Farver. 2002. Sizing Stream Setbacks to Help Maintain Stream Stability. Paper Number: 022239. 2002 ASAE Annual International Meeting. Chicago, IL, USA. July 28-July 31, Available online: <https://elibrary.asabe.org/abstract.asp?aid=9376&t=2&redir=&redirType=2002>
- Williams, G.P. 1986. River meanders and channel size. *Journal of Hydrology*, 88 (1-2): 147-164. Available online: <https://www.sciencedirect.com/science/article/abs/pii/0022169486902027?via%3Dihub>
- Wolman, M.G. 1954. A method of sampling coarse riverbed material. *Transactions of the American Geophysical Union*, 35 (6): 951 – 956. Available online: <https://doi.org/10.1029/TR035i006p00951>
- Wood Environment & Infrastructure Solutions. 2020. Environmental Screening Report – Phase 1 for the Peel 2051 Settlement Area Boundary Expansion. Prepared for the Region of Peel. Available online: <https://peelregion.ca/business/planning/official-plan/focus-areas-supporting-studies/settlement-area-boundary-expansion>
- Wood Environment & Infrastructure Solutions, GHD Group, and Palmer Environmental Consulting Group. 2022. Scoped Subwatershed Study – Phase 2: Characterization, Impact Assessment, and Implementation Plan (Parts A–C). Prepared for the Region of Peel. Available online: <https://peelregion.ca/business/planning/official-plan/focus-areas-supporting-studies/settlement-area-boundary-expansion>
- Wood. 2022a. Scoped Subwatershed Study, Part A: Existing Conditions and Characterization (Final Report). Prepared for the Regional Municipality of Peel.
- Wood. 2022b. Scoped Subwatershed Study, Part B: Detailed Studies and Impact Assessment (Final Report). Prepared for the Regional Municipality of Peel.

Wood. 2022c. Scoped Subwatershed Study, Part C: Implementation Plan (Final Report). Prepared for the Regional Municipality of Peel.