



North Halton Coordinated EA - Regional Road 25 Improvements

Natural Environment Report

Prepared for:

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

North Halton Coordinated EA - Regional Road 25 Improvements

Natural Environment Report

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HDR Inc., on behalf of Halton Region, to complete a Natural Environment Report (NER) to inform the Municipal Class Environmental Assessment (MCEA) and Preliminary Design for improvements to Regional Road 25 between 5 Sideroad and 10 Sideroad in the Town of Halton Hills. This work was completed as part of the larger North Halton Coordinated MCEA for transportation corridor improvements for three regional road corridors. In order to support future travel demand and a transportation system that is safe, continuous, connected, and coordinated for all users and all abilities, improvements to Regional Road 25 are required to improve facilities for pedestrian, cyclists, mobility device users and other non-vehicular travel to create a safe and accessible network, and improve overall operations including intersections, as well as localized widening (e.g. turn lanes).

For the purposes of this work, a “study area” was defined as the lands within 120m of the Regional Road 25 right-of-way (ROW) between 5 Sideroad and 10 Sideroad; however, a focus of this work has been on the lands and features immediately adjacent to the ROW that have potential to be impacted by the proposed undertaking (Map 1). This report refers to Regional Road 25 as following a north-south orientation; therefore, true northeast = “east”, true southwest = “west”, etc.

The study area currently consists of natural, agricultural and developed areas. The southern half of the study area, closer to 5 Sideroad, is predominantly used for agricultural, rural residential and warehouse purposes. There is relatively less natural feature cover within the southern half, but coverage includes wetlands, woodlands, hedgerows and a crossing of Middle Sixteen Mile Creek. The northern half of the study area comprises relatively more natural feature cover, and includes some rural residential and golf course lands (Map 1). The surrounding lands consist of similar natural and developed features.

The study area contains areas of provincial natural heritage significance as mapped within the Greenbelt Plan (OMMA 2017) and the Niagara Escarpment Plan (MNRF 2021a). The majority of the study area also falls within the Regional Natural Heritage System as mapped in the Regional Official Plan (OP) (Halton Region 2024). The study area incorporates natural features along the Middle Sixteen Mile Creek corridor that fall within the Town of Halton Hills Greenlands system as shown on Schedule A2 of the OP (Town of Halton Hills 2024). Specifically, natural features that fall within the Greenbelt Plan area to the east of the ROW and south of 10

Sideroad are mapped as Greenbelt Greenlands Area, while natural features to the west of the ROW and to the north of 10 Sideroad are mapped as “Greenlands B”.

This report summarizes background information on natural heritage features within the study area as well as the results of field surveys completed to accurately characterize the existing natural environment conditions. The detailed characterization was used to undertake an analysis of natural feature significance and sensitivity for the study area natural features. This analysis was completed with consideration for applicable Town, Regional and Provincial policies and legislation. An impact assessment has been completed based on details of the selected Preliminary Design for the road improvements. The impact assessment incorporates an analysis of direct impacts (i.e., impacts within the footprint of the planned undertaking), as well as indirect impacts (e.g., due to road runoff/stormwater management and water quality mitigation). General recommendations pertaining to ecological restoration and enhancement opportunities and monitoring have also been provided. These recommendations are to be reviewed and refined as required based on the subsequent Detailed Design of the road improvements.

This NER study has been completed in conjunction with a Preliminary Tree Inventory Report, which is presented under a separate cover (NRSI 2025). Pertinent results from the Tree Inventory Report have been summarized in this report.

2.0 Background Information Review and Significant Habitat Screening

2.1 Background Information Secondary Sources

In order to determine a study approach for the NER, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area. Existing background information was requested from Conservation Halton and the Ontario Ministry of Natural Resources (OMNR). A written response was received from the OMNR on September 15, 2023 and from Conservation Halton on August 2, 2023. Information received from Conservation Halton included a geospatial dataset of wildlife species observations for the study area (Conservation Halton 2023). However, it is NRSI's understanding that the plotted wildlife observation points do not necessarily accurately represent where the species observation was actually made and may represent a point within a large generalized area. Due to this, and the age of certain observation data (some >40 years old), these geospatial data have been used as additional background on species that may occur within the study area, subject to suitable habitat availability.

Background information on the natural environment features within the study area vicinity (within up to 10km) was also gathered from the OMNR Natural Heritage Information Centre online database of provincially-tracked species (OMNR 2025a), the OMNR's Land Information Ontario mapping, and relevant taxa-specific databases, as listed below.

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (within 10x10km survey squares (17NJ82) containing the study area) using various atlases including the Ontario Breeding Bird Atlas (BSC et al. 2008), the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019), and the Ontario Butterfly Atlas (Macnaughton et al. 2023). The Ontario Mammal Atlas (Dobbyn 1994) was reviewed within the 100x100km survey square (NU82). Ontario Odonata Atlas Database (OOAD 2023) species occurrence records was received from NHIC for the atlas squares containing the study area.

Other information sources that were reviewed to inform project scoping included the following:

- Conservation Halton Web Maps Data and Online Mapping (2023b);
- Halton Region Official Plan (2024);
- Town of Halton Hills Official Plan (2024);
- eBird (eBird 2023); and,

- iNaturalist (iNaturalist 2023).

2.2 Significant Species and Habitat Screening

Species at Risk (SAR) are those listed on the Protected Species in Ontario List (MECP 2026). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered or Threatened. Species listed as Endangered or Threatened are protected under the *Species Conservation Act* (SCA), which includes protection of their defined habitat. SAR also include those species that are listed under Schedule 1 of the federal *Species at Risk Act* (SARA). Since the study area does not include federal lands, only migratory birds and aquatic species that are listed under Schedule 1 of the SARA receive protection within the study area. For the purposes of this report, the term “SAR” will refer to provincially or federally Threatened and Endangered species regulated under the SCA or SARA.

Based on NRSI's examination of background sources and federally or provincially significant species with occurrence records in the study area vicinity (within 10km), an assessment of SAR suitable habitat presence within the study area was completed. Assessments of habitat suitability in the study area were made by cross-referencing each species' known habitat preferences or requirements (e.g., OMNR 2000) with habitat availability based on satellite imagery and available mapping.

As part of the review of background NHIC data records for the study area, an NHIC-restricted species was identified as an observation record in the nearby study area vicinity. Certain provincially-tracked species are restricted by the NHIC due to their high sensitivity to disturbance and vulnerability to exploitation. An NRSI biologist with NHIC data sensitivity training requested the record details from the NHIC. Based on the results of the SAR/SCC habitat assessment, the restricted plant species was determined to have potentially suitable habitat in the study area.

A preliminary screening for the presence of SWH was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the OMNR considers significant in Ontario as well as criteria to identify these habitats (OMNR 2000, MNRF 2015a). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of Species of Conservation Concern (SCC), and animal movement corridors.

This screening involved the comparison of OMNR criteria outlined for Ecoregion 6E, in which the study area is located, against habitats known to occur in the study area.

The definition of SCC includes the following:

- species that are listed as Special Concern in Ontario by COSSARO,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre (MNR 2021), and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species may be protected by the federal SARA if they are listed as Threatened or Endangered on Schedule 1 of the SARA.

Habitat for SCC may be considered Significant Wildlife Habitat (SWH) (OMNR 2010), which is afforded protection under the Provincial Planning Statement (OMMAH 2024) and municipal natural heritage protection policies.

The results of the significant species habitat screenings were used to inform the fieldwork program and to facilitate identification of potentially significant habitats within the study area. See Sections 6.4 and 6.5 for the results of the SAR/SCC habitat assessment and SWH assessment, respectively, for the study area based on the results of background information review and field surveys.

3.0 Relevant Policies, Legislation, and Planning Studies

Table 1 provides an overview of natural heritage-based policies and legislation that were considered and informed the NER. To help inform the road preliminary design, identify areas to be protected and inform mitigation strategies, inventoried natural features were evaluated against relevant policies and legislation outlined in the following sections. The specific implications of these policies to the proposed undertaking are discussed in further in Section 6.0.

Table 1. Relevant Policies, Legislation and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Planning Statement (OMMAH 2024).	• Issued under the authority of Section 3 of the Planning Act and came into effect on October 20, 2024, replacing the 2020 Provincial Policy Statement. • Section 4.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as ‘significant’. • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015a) were prepared by the MNR to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Natural features that occur or may occur within the study area, and which receive protection under the PPS, include: • Fish Habitat, • Significant Woodlands, • Significant Wetlands, • Potential Significant Wildlife Habitat, and • Potential habitat for Endangered and Threatened species. • Section 4.1.3 of the PPS states that development or site alteration shall not be permitted in significant wetlands in Ecoregion 6E, in which the study area is located. • Section 4.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Woodlands or Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions. • Section 4.1.8 of the PPS states that development and site alteration shall not be permitted on adjacent lands to the natural features described above unless it is demonstrated that there will be no negative impacts to the natural features or their ecological functions. • Section 4.1.6 of the PPS states that development or site alteration shall not be permitted in fish habitat except in accordance with provincial or federal requirements. • Section 4.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements. • Section 4.1.2 of the PPS states that the connectivity of natural features in an area should be maintained, restored, or where possible, improved.

Policy/Legislation	Description	Project Relevance
Greenbelt Plan (OMMA 2017)	The Greenbelt Plan was prepared and approved under the Greenbelt Act (2005) and took effect in December 2004. An amendment to the Greenbelt Plan became effective July 1, 2017.	- A portion of the study area, along the east side of Regional Road 25, including lands directly abutting the ROW (Map 1), falls within the Greenbelt Plan NHS. - Within the NHS, Key Natural Heritage Features that do or may occur within the study area include the following: - Habitat of Endangered and Threatened Species; - Fish Habitat; - Wetlands; - Significant Woodlands; and - Significant Wildlife Habitat. - Within the NHS, Key Hydrologic Features that do or may occur within the study area include the following: - Permanent and intermittent streams; - Seepage areas and springs; and - Wetlands. - Section 4.2.1.2 of the Plan states that the location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside are subject to, in part, the following: - Minimizing, where possible, the amount of the NHS and Water Resource System features that are traversed and/or occupied by the infrastructure. - Minimizing, where possible, negative impacts and disturbance of the existing landscape, such as through impacts caused by light intrusion, noise, and road salt. - New or expanding infrastructure shall avoid Key Natural Heritage Features, Key Hydrologic Features or Key Hydrologic Areas unless need has been demonstrated and it has been established that there is no reasonable alternative. - Where infrastructure intrudes into or results in the loss of Key Natural Heritage Feature, Key Hydrological Feature or Key Hydrologic Area, negative impacts on and disturbance of the features

Policy/Legislation	Description	Project Relevance
		and their ecological functions shall be minimized and, where reasonable, will maintain or improve connectivity.
Niagara Escarpment Plan (MNRF 2021a)	The Niagara Escarpment Plan (NEP) outlines policy to protect the area of the Niagara Escarpment which is classified by the United Nations Educational, Scientific and Cultural Organization as a World Biosphere Reserve.	- Portions of the central and northern study area, to the west of the Regional Road 25 ROW, are subject to the NEP. Specifically, a central portion of the study area, corresponding to Chudleigh's Entertainment Farm, is mapped as Escarpment Protection Area and extends to the ROW. Portions of Escarpment Natural Area extend into the northern study area, but do not directly abut the ROW (Map 1). - Key Natural Heritage Features that do or may occur within the study area include the following: - Wetlands; - Habitat for Endangered or Threatened species; - Fish habitat; - Significant Woodlands; - Significant Wildlife Habitat; and - Habitat of Special Concern species in Escarpment Natural and Escarpment Protection Areas. - Key Hydrologic Features that do or may occur within the study area include the following: - Permanent and intermittent streams; - Seepage areas and springs; and - Wetlands - Sections 2.7.2 and 2.7.2 of the NEP states that development is not permitted in Key Hydrologic Features and Key Natural Heritage Features, except, in part: - Infrastructure, where the project has been deemed necessary to the public interest and there is no other alternative. - Section 2.7.6 of the NEP states that if the opinion of the implementing authority, a proposal for development within 120m of a key natural heritage feature has the potential to result in a negative impact on the feature and/or its functions, a natural heritage evaluation will be required that meets criteria 2.7.6 a)-

Policy/Legislation	Description	Project Relevance
		d). - Section 2.12 contains further policies to ensure that infrastructure development is designed and located such that impacts are minimized to the extent possible, such as through, but not limited to: - minimizing blasting, grading, and tree removal where possible through realignment or utilization of devices, such as curbs and gutters, retaining walls and tree wells; - finished slopes should have grades no steeper than 50% and be planted; large cuts should be terraced to avoid surface erosion and slope failure; - site rehabilitation should use native species of vegetation and protect and enhance the natural environment - and further, that: - infrastructure shall avoid Escarpment Natural Areas, unless the project has been deemed necessary to the public interest and after all other alternatives have been considered.
<i>Species Conservation Act</i>	- The SCA came into force in April 2026, replacing the earlier Endangered Species Act - The SCA prohibits killing or harming of SAR and protects their defined habitats from damage and destruction. - Species that are subject to protections under the SCA are listed in the Protected Species in Ontario list (Ontario Regulation 60/26).	Based on a preliminary assessment, multiple SAR were identified as having the potential to occur within the study area based on presence of suitable habitat.
<i>Migratory Birds Convention Act, 1994 and Migratory Birds Regulations (2022)</i>	- The <i>Migratory Birds Convention Act</i> (MBCA) protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. - The schedule of on-site work must consider MBCA windows, with timing of breeding bird	Any vegetation removal required for construction of the proposed development must have regard for this legislation in the form of timing window restrictions or other suitable mitigation measures.

Policy/Legislation	Description	Project Relevance
	season typically occurring between April 1 and August 31; however, this is a guideline, since the MBCA applies anytime a migratory bird is nesting. • “Incidental take” (unintentional harming, killing, disturbance, or destruction of migratory birds, their nests, or eggs as a result of an activity that is not specifically targeting the bird or nest) is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service. • Schedule 1 of the MBR 2022 provides year-round nest protection for 18 species that are known to re-use nests annually.	
Halton Region Official Plan (2024)	• The Halton Region OP identifies the natural features, ecological functions and potential linkages and corridors that comprise the Natural Heritage System (NHS). • The NHS consists of both the Greenbelt Natural Heritage System and the Regional Natural Heritage System. Within the NHS, Key Features are to be protected and maintained for conservation purposes.	• Regional NHS features that occur or may occur within the study area include: • Key Features, which include: ▪ Potential Significant Wildlife Habitat, ▪ Potential habitat for Endangered and Threatened species, ▪ Fish habitat, ▪ Significant wetlands, and ▪ Significant woodlands. • Watercourses • Linkages • According to Map 1 of the Region OP, the study area is within the NHS and Greenbelt NHS overlay. • According to Map 1G, the study area contains Key Features and Enhancement Areas, Linkages, and/or Buffers. • Section 118 states that it is the policy of the Region to prohibit development and site alteration within significant wetlands, significant habitat of endangered and threatened species and fish habitat except in accordance with Provincial and Federal legislation or regulations. Further, it is the policy of the Region to not permit the alteration of any component of the Regional NHS unless it has been demonstrated that

Policy/Legislation	Description	Project Relevance
		there will be no negative impacts on the natural features and areas or their ecological functions. • Section 117.1 of the Regional OP states that, subject to other applicable provincial policies (e.g., NEP, Greenbelt Plan), that “essential transportation and utility facilities” may be permitted within the Regional NHS. • Section 118.2(a) of the Regional OP states that development and site alteration within Significant Wetlands, Significant Coastal Wetlands, significant habitat of Endangered and Threatened species and fish habitat is prohibited except in accordance with Provincial and Federal legislation or regulations. • Section 139.3.7.3 of the Regional OP states that, subject to other policies of the OP, essential transportation and utility facilities are permitted within Key Features of the Greenbelt NHS. • Section 139.3.7.4 of the Regional OP states that development and site alteration, including public works, that is located wholly or partially within the Greenbelt NHS or within 120m of a Key Feature must carry out an Environmental Impact Assessment (EIA). The EIA must identify a Vegetation Protection Zone that is of sufficient width to protect the Key Feature from the proposed land use change and associated activities before, during and after construction, and where possible, restore or enhance the feature and/or its functions. The Vegetation Protection Zone is to be maintained as natural self-sustaining vegetation.
Town of Halton Hills Official Plan (2024)	• Land use within the Town of Halton Hills is guided through the OP. The OP aims to protect ecological systems, including natural areas, features, and functions. The Plan establishes a Greenlands System in accordance with the requirements of the Halton Region OP.	• The study area may include “Greenlands A”. Under the Town OP, “Greenlands A” includes the following: • Significant habitat of Endangered or Threatened species, • Provincially Significant Wetlands, and • Areas included within regulatory floodplains. • Section B1.3.1.2 of the Town OP states that “essential transportation and utility facilities” are a permitted use within “Greenlands A” features.

Policy/Legislation	Description	Project Relevance
		• As shown on Schedule A2, the study area includes “Greenlands B” that corresponds to the Middle Sixteen Mile Creek corridor west of Regional Road 25 and north of 10 Sideroad. Under the Town OP, “Greenlands B” includes the following: • Fish Habitat, • Significant Woodlands, and, • Significant Wildlife Habitat, • Section B1.3.2.2 of the Town OP states that “transportation and utility facilities” are a permitted use within “Greenlands B” features. • As shown on Schedule A2, the study area includes Greenbelt Greenlands Area where the Middle Sixteen Mile Creek corridor falls within the Greenbelt Plan area east of Regional Road 25 and south of 10 Sideroad. • Section E2.5.3.3 of the OP permits infrastructure development within a Greenbelt Greenlands Key Natural Heritage Feature or Key Hydrologic Feature, subject to the policies of Section E2.6 of the OP. • Section E2.6.1 of the OP states that the location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside are subject to, in part, the following: • Minimizing, where possible, the amount of the NHS and Water Resource System features that are traversed and/or occupied by the infrastructure. • Minimizing, where possible, negative impacts and disturbance of the existing landscape, such as through impacts caused by light intrusion, noise, and road salt. • New or expanding infrastructure shall avoid Key Natural Heritage Features, Key Hydrologic Features or Key Hydrologic Areas unless need has been demonstrated and it has been established that there is no reasonable alternative.

Policy/Legislation	Description	Project Relevance
		- Where infrastructure intrudes into or results in the loss of Key Natural Heritage Feature, Key Hydrological Feature or Key Hydrologic Area, negative impacts on and disturbance of the features and their ecological functions shall be minimized and, where reasonable, will maintain or improve connectivity. - As shown on Schedule A2, the northwest quadrant of the study area includes Niagara Escarpment Plan Escarpment Protection Area and Escarpment Natural Area. - Section B4.2.1.3 of the OP permits essential transportation and utility facilities within Escarpment Natural Area, subject to other policies of the OP and development criteria contained within the Niagara Escarpment Plan. - Section B4.2.2.3 of the OP permits transportation and utility facilities within Escarpment Protection Area, subject to other policies of the OP and development criteria contained within the Niagara Escarpment Plan. - Section B1.2.5 of the OP states that development within Significant Wetlands and Significant Habitat of Endangered and Threatened Species is prohibited.
Ontario Regulation 41/24 (Prohibited Activities, Exemptions and Permits)	- Regulation issued under <i>Conservation Authorities Act</i>, R.S.O. 1990. Effective date April 1, 2024. - Interim policy guidelines are provided for this regulation while preceding regulations are updated - CH has the responsibility to regulate activities in and adjacent to hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes).	- Wetlands and a watercourse (Middle Sixteen Mile Creek) are present within the study area. - Wetlands and watercourses are regulated as hazard features by CH. Development and site alteration is prohibited in regulated areas unless permitted by CH.
<i>Fish and Wildlife Conservation Act, 1997</i>	The <i>Fish and Wildlife Conservation Act</i> (FWCA) provides protection for certain bird species not protected under the MBCA (e.g., raptors), as well as furbearing	The timing of construction activities, especially vegetation clearing and site grading must have consideration for bird nesting and den sites for furbearing mammals.

Policy/Legislation	Description	Project Relevance
	mammals and their dens or habitual dwellings, aside from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>)	Wildlife sweeps by a qualified biologist are recommended in advance of any vegetation clearing and site grubbing during the bird active season to ensure that no active nests/dens are present.
<i>Fisheries Act, 1985</i>	- Manages threats to the sustainability and productivity of Canada's commercial, recreational and Aboriginal fisheries. - The Act prohibits "serious harm to fish" including destruction of habitat.	- Middle Sixteen Creek, where it crosses the Regional Road 25 ROW in two locations within the study area, contains permanent fish habitat. - If alteration or removal of direct or indirect fish habitat is proposed, the DFO must be consulted through their Request for Review process to determine if a permit under the <i>Fisheries Act</i> may be required.

4.0 Field Methods

Terrestrial and aquatic field surveys were completed across 23 site visits between the period of April 2023-May 2024 to characterize the existing natural features present within the study area. Table 2 provides a summary of field surveys undertaken within the subject property. Details of the survey methodologies are presented below.

4.1 Vegetation Community Mapping and Vascular Flora Inventory

Vegetation communities were described and mapped according to the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). Detailed mapping of natural features was completed where site access was granted. For properties where access was not granted, assessments were completed from roadsides or property lines, informed by available aerial imagery and background mapping (topography and mapped wetlands). Vegetation community mapping completed during spring and summer 2023 (May 8, May 11 and September 7) was completed from the Regional Road 25 ROW. During late Spring 2024 (May 31), supplementary work was completed to update and refine vegetation community mapping where Permission to Enter had been granted to specific private properties (see Map 2).

NRSI biologists completed a comprehensive two-season (spring and summer 2023) inventory of vascular flora for each of the mapped vegetation communities based on what could be observed from within the ROW. The vascular plant list was compiled by ELC polygon with an abundance code assigned (dominant, abundant, occasional, rare) in one or more strata (canopy, sub-canopy, shrub layer, groundcover). This inventory also recorded any federally, provincially, or regionally significant vegetation species. Additional vegetation species were documented to inform the refinement of ELC vegetation community mapping within participating properties during the supplementary 2024 site investigations.

NRSI biologists flagged woodland dripline and wetland boundaries where they occurred within or along the boundaries of the ROW. Woodland dripline delineation focused on woodlands that were considered Significant Woodlands in Halton Region (see Section 6.0). These boundaries were reviewed and confirmed by Conservation Halton (wetland boundaries) and Halton Region (woodland boundaries) staff. The confirmed woodland dripline and wetland boundaries were surveyed by Tham Surveying at the time of the agency site meeting.

Table 2. Field survey summary.

Survey Type	Survey Protocol	Dates	Time	Approx. Person Hours	Weather Conditions				
					Air Temp. (°C)	Precip.	Cloud Cover (%)	Wind (Beaufort Scale)	Staff
Vegetation community mapping and inventory	Lee et al. 1998	May 8, 2023	9:30 – 15:35	12 Hours	13°C	None	5%	2	P. Deacon S. Munoz
	Comprehensive area search by ELC polygon	May 11, 2023	9:25 – 11:00	3 Hours	17°C	None	50%	1	P. Deacon S. Munoz
		September 7, 2023	12:15 – 17:00	10.5 Hours	24°C	Rained Earlier	80%	1	S. Deweerd S. Munoz
		May 31, 2024	-	-	18°C	None	0%	0	S. Munoz A. Cantwell
Woodland dripline and wetland boundary delineation and agency confirmation	MNRF 2022 (wetland boundaries)	October 2, 2023	-	-	-	-	-	-	P. Deacon E. Krauss
		October 3, 2023	-	-	-	-	-	-	S. Deweerd S. Munoz
Bat habitat assessments (trees and built structures)	MECP 2022a, 2022b	May 10, 2023	9:00 – 16:00	14 Hours	20°C	None	0%	1	S. Munoz M. Douglas
Breeding bird surveys	Birds Canada et al. 2021	June 6, 2023	6:40 – 8:10	1.5 Hours	16°C	None	20%	2	R. Archer
		June 21, 2023	7:10 – 8:35	1.5 Hours	15°C	None	0%	1	J. Nafziger
Tree inventory	N/A	April 24, 2023	-	-	-	-	-	-	M. Postma J. Richard H. Manoharan
		April 27, 2023	-	-	-	-	-	-	M. Postma J. Bannon S. Munoz S. Hofstetter
		May 10, 2023	9:00 – 16:00	14 Hours	20°C	None	0%	1	S. Munoz M. Douglas
Aquatic habitat assessments	MTO 2009	June 7, 2023	14:45 – 17:15	5 Hours	17°C	N.R.	N.R.	N.R.	G. MacVeigh A. Cantwell
Ambystoma	N/A	May 31, 2024	-	-	18°C	None	0%	0	A. Cantwell

Survey Type	Survey Protocol	Dates	Time	Approx. Person Hours	Weather Conditions				
					Air Temp. (°C)	Precip.	Cloud Cover (%)	Wind (Beaufort Scale)	Staff
habitat assessments									S. Munoz
Anuran call surveys	BSC 2009	April 21 2023	22:00 - 22:25	0.25 Hours	12°C	Rain	100%	1	S. Burgin
		May 23, 2023	21:15 - 21:45	0.5 Hours	14°C	None	25%	1	A. Siemens
		June 20 2023	22:35 - 22:55	0.25 Hours	20°C	None	0%	1	T. Sieg
Turtle basking surveys	MNRF 2015b	May 6, 2023	14:00 – 14:30	0.5 Hours	18°C	None	25%	1	S. Gilmour
		May 8, 2023	12:30 – 13:00	0.5 Hours	18°C	None	15%	3	T. Sieg
		May 10, 2023	12:55 – 13:45	0.75 Hours	21°C	None	0%	1	J. Mennen
		May 23, 2023	12:15 – 12:45	0.5 Hours	19°C	None	0%	1	S. Gilmour
		May 30, 2023	11:10 – 11:40	0.5 Hours	25°C	None	10%	2	M. Alexandrou

4.2 Tree Inventory

An inventory of trees ≥ 10 cm in Diameter at Breast Height (DBH) along Regional Road 25, between 5 Sideroad and 10 Sideroad, was completed by NRSI Certified Arborists and Registered Professional Foresters on April 24 and 27, and May 10, 2023. As ROW survey data was not yet available, the tree inventory effort included all trees within 6m of the existing road edge. Trees located on private properties, with the potential to be impacted by the development, were assessed from the property boundary. This inventory will be updated at the Detailed Design stage based on the refined proposed grading and development limits.

Individual trees ≥ 10 cm in DBH were assigned an alphanumeric identifier. Tree ownership was determined conservatively through desktop analysis based on the ROW limit provided by HDR Inc. The location of all inventoried trees was surveyed using an SXBlue II GNSS GPS unit. The following information was recorded for inventoried trees:

- Tree location;
- Tag number/alphanumeric identifier;
- Species (common and scientific name);
- DBH (cm);
- Number of stems;
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, snag);
- Potential for structural failure (Improbable, Possible, Probable, Imminent); and
- General comments (i.e., disease, aesthetic quality, development constraints, prune to reduce structural failure, sensitivity to development, etc.).

4.3 Breeding Bird Surveys

Two rounds of early morning breeding bird surveys were conducted on June 6 and 21, 2023, in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Birds Canada et al. 2021). Surveys were completed between a half-hour before sunrise and 10:00am and were timed to occur at least 10 days apart. Surveys were completed through the completion of 10-minute point counts with additional species recorded between point counts when encountered. Standard breeding evidence codes were recorded based on OBBA protocol. Surveys were

completed from five point count stations as shown on Map 2. These stations were positioned to survey a variety of natural habitats that are present within the study area.

4.4 Anuran Call Surveys

Three rounds of nighttime anuran call surveys were completed on April 21, May 23 and June 20, 2023, in accordance with the Marsh Monitoring Program amphibian survey protocol (BSC 2009). Surveys comprised three-minute passive-listening point counts at three roadside survey station locations (Map 2). Surveys were conducted when the air temperatures were at least 5°C, 10°C, and 17°C during each survey, respectively, and between one-half hour after sunset and midnight. Species were recorded according to their three-level calling code categories of calling intensity. Code 1 was recorded when calls from a species were not overlapping and the number of individuals could be estimated), Code 2 was recorded when calls were overlapping but the number of individuals could still be estimated, and Code 3 was recorded when a species was calling at full chorus and the number of individuals could not be estimated. The estimated number of calling individuals was also recorded for Calling Codes 1 and 2.

4.5 Turtle Visual Encounter Surveys

Five turtle basking surveys were conducted during May 2023 within the study area. These surveys primarily consisted of visually searching for basking turtles, following the *Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario* (MNRF 2015b). In accordance with the protocol, the surveys were completed during the early April – early June timing window, and under suitable weather conditions. NRSI biologists recorded the number of individuals, species, behaviour and UTM coordinates of all observed turtles. One survey station was established within the study area (TB-001; Map 2a), which surveyed the Reed Canary Grass Mineral Meadow Marsh (MAM2-2) wetland due to past satellite imagery showing this feature containing seasonally standing water. The focus of this survey was to assess the presence of the SAR Blanding's Turtle within the study area, due to the known presence of this species within approximately 10km of the study area (Ontario Nature 2019). The presence of other turtle species in the study area was also documented through these surveys.

4.6 Ambystoma Salamander Habitat Assessment

As part of site visits completed on May 24, 2023, NRSI biologists identified and mapped the presence of suitable *Ambystoma* salamander breeding habitat within the study area, based on the known habitat preferences of these species (Jefferson Salamander Recovery Team 2013). This habitat assessment was undertaken due to past records of the SAR Jefferson Salamander

(*Ambystoma jeffersonianum*) and Unisexual *Ambystoma* salamanders (Jefferson Salamander-dependent population) (*Ambystoma laterale* - (2) *jeffersonianum*) within approximately 1-10km of the study area (OMNR 2025a, Ontario Nature 2019). Factors such as a potentially suitable hydroperiod for larval development, abundance and quality of egg attachment sites, the absence of predatory fish and the presence of other breeding amphibians were noted in the assessment of habitat suitability. An initial assessment of the study area natural features was completed from roadside on May 24, 2023, and was based on what could be observed from the ROW limits and supplemented through aerial photo interpretation. Following issuance of Permission to Enter for certain private properties (see Map 2), a supplementary habitat assessment was completed for the natural features on those properties on May 31, 2024, which allowed for a more detailed investigation of habitat suitability.

4.7 Bat Habitat Assessment

A leaf-off bat habitat assessment for treed communities and individual trees was completed on May 10, 2023. Surveys were completed from roadside based on what could be observed from the ROW limits. Woodland edges, hedgerows and isolated trees with the potential to be removed through future road improvement activities were assessed. Standing live or dead trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for the SAR Little Brown Myotis (*Myotis lucifugus*) and/or Northern Myotis (*Myotis septentrionalis*) were documented in accordance with provincial guidelines (MECP 2022a, b). Trees producing leaf clusters that were potentially suitable for Tri-colored Bat (*Perimyotis subflavus*) were also documented. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree.

The bat habitat assessment methodology completed for this study was targeted to assess the SAR that were listed on the Species at Risk in Ontario (SARO) list at the time of the 2023 fieldwork that have potentially suitable habitat within the study area (i.e., Little Brown Myotis, Northern Myotis, and Tri-colored Bat). On January 27, 2025, the provincial SARO list was amended to list the following bat species as Endangered in Ontario: Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*), and Eastern Red Bat (*Lasiurus borealis*). All of the bat SAR previously protected under the *Endangered Species Act* are now protected under its successor legislation, the SCA. Silver-haired Bat, Hoary Bat and Eastern Red Bat include population ranges that cover all of southern Ontario, and all have habitat preferences that coincide with wooded natural features within the study area (COSEWIC 2023).

Silver-haired Bat uses similar roosting habitat features as Little Brown Myotis and Northern Myotis (e.g., trees with suitable cavities and hollows). As such, the completed habitat assessment is considered suitable to address the potential presence of Silver-haired Bat within roadside areas. However, roosting habitat features for Hoary Bat and Eastern Red Bat differ from the other bat SAR (e.g., use of supercanopy trees within forest communities), and were not fully assessed within this scope of work. See Section 6.4.2 for discussion about how potential habitat for these species was identified within the study area.

4.8 Aquatic Habitat Assessments

NRSI biologists completed aquatic habitat assessments following the Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat (2009) and mapping within the watercourse crossing of the Regional Road 25 ROW on June 7, 2023. The habitat assessment informed the overall significance and sensitivity of the feature, and identified potentially suitable habitat for any SAR/SCC fish species documented from the vicinity of the study area. The following physical parameters were recorded as part of the assessments, where feasible:

- Substrate composition and abundances,
- General characteristics and channel morphology (i.e., channel depth, width, etc.),
- Water temperature,
- Water chemistry parameters (i.e., dissolved oxygen concentrations, pH, conductivity, and total dissolved solids),
- Bank stability,
- Evidence of groundwater discharge,
- Aquatic vegetation cover,
- Critical life stage areas (i.e., spawning, nursery habitat, etc.), and;
- Potential barriers to fish passage and availability of fish habitat.

4.9 Wildlife Habitat Assessment and Incidental Wildlife Observations

All incidental observations of wildlife (e.g., mammals, butterflies, odonates (dragonflies and damselflies)) were documented during all field visits. This included both direct and indirect (e.g., tracks, scat, dens, nests, etc.) observations of wildlife presence. Features and species that may be indicative of SWH, as informed by the results of the SWH screening were documented during the course of all site investigations.

5.0 Existing Conditions

5.1 Soil, Terrain and Drainage

The majority of the study area falls within the physiographic region known as the South Slope, immediately below the Niagara Escarpment. The Niagara Escarpment physiographic lands extend into the far northern/northwestern extent of the study area. The study area is thus characterized as following a general downward slope from northwest to southeast, toward Lake Ontario. The South Slope contains drumlinized areas with thin (<1m) aeolian sand deposits overlaying glacial deposits (Thurber Engineering 2025).

The surficial soils primarily comprise clay to silt-textured till, with ice-contacted stratified deposits of sand and gravel located within the northern portion of the study area. Modern alluvial deposits of clay, sand, silt and gravel are located along the watercourses. Organic deposits of peat, muck and marl are located within the organic swamps comprising the Chudleigh Swamp complex within the study area (Thurber Engineering 2025).

The study area falls within the Middle Sixteen Mile Creek subwatershed, which drains into the larger Sixteen Mile Creek watershed. Middle Sixteen Mile Creek itself passes through the study area and crosses Regional Road 25 in two locations (at the far northern study area limit where it flows westwards, and centrally within the study area where it flows eastwards). A smaller subcatchment drains toward an ephemeral tributary to Middle Sixteen Mile Creek within the study area, which also crosses under Regional Road 25 in a westerly direction when flowing (Map 1).

Regional groundwater flows in a southeasterly direction toward Lake Ontario. Groundwater level monitoring completed between October and December 2023 within the study area found the highest groundwater elevation to be 2.8m below ground surface (Thurber Engineering 2025), although higher groundwater elevations may occur through seasonal fluctuations, such as during the spring

5.2 Terrestrial Features

5.2.1 Vegetation Communities

The Regional Road 25 study area comprises a mix of natural land cover, agricultural lands (including the large Chudleigh's orchard), rural residential lots fronting the road, the Glencairn Golf Club, and commercial businesses at the far southern end. The Regional Road 25 corridor includes relatively high-quality forest and wetland communities in the northern and central

extent and transitions to more sparsely distributed habitats that are lower quality and situated among a higher density of residential lots and a trucking yard in the southern extent.

In the south (Map 2a), two areas of marsh are present; one at the roadside dominated by cattail (*Typha* sp.) (MAS2-1) and a second marsh dominated by non-native Reed Canary Grass (*Phalaris arundinacea*) (MAM2-2) is present approximately 40m from the road. These wetlands are on the west side of the road, approximately 300m north of Sideroad 5. The cattail marsh is immediately adjacent to the roadway with minimal buffer between the road and the wetland. The feature likely receives large amounts of road salt and the monoculture of cattails is generally tolerant of disturbance.

Further north (Map 2b), a lowland Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9) that is largely comprised of mid-age Bur Oak (*Quercus macrocarpa*) is present on the east side of the road as well as small areas of Reed Canary Grass Mineral Meadow Marsh (MAM2-2) on both sides of the road. The portion of the forest observed from the roadside appeared to be of low diversity with the non-native Reed Canary Grass extending into the sparse edge of oak trees, which becomes denser further east into the feature. The majority of the FOD9 woodland polygon is currently mapped as wetland by Conservation Halton (Conservation Halton 2024a). See Appendix I for the ELC data form that identifies this feature as a terrestrial woodland community. The natural features at this location collect and direct surface water to the east and as such the herbaceous cover plays a role in maintaining water quality as the agricultural fields to the west are likely to have some erosion and nutrient inputs moving through the wetlands on a seasonal basis. The MAM2-2 meadow marsh features are of low diversity; the feature on the west side of the road is likely periodically cultivated by farm machinery, but then re-establishes when conditions for crop production are too wet. The FOD9 forest community appears to be of moderate quality and the exposed edge is tolerant of the disturbance associated with the road corridor.

At Middle Sixteen Mile Creek (AHP-002; Map 2c), to the northeast of Chudleigh's Entertainment Farm, the watercourse is flanked by intact and diverse mixed swamp communities. These swamp features comprise stands of White Cedar Mineral Mixed Swamp (SWM1-1) to the west of the road and White Cedar-Hardwood Organic Mixed Swamp (SWM4-1) to the east of the road. Despite the presence of invasive species and disturbance along the roadsides, these swamp features are in good condition and invasive species are limited to buckthorn shrubs along the exposed edges. The natural cover in this area contributes greatly to the water quality

within the watercourse with broad vegetated riparian corridors shading the creek and providing bank stability. The habitat structure is complex with shaded areas, small clearings, tree tip-ups and saturated organic soils. Two smaller areas of upland forest (Fresh-Moist White Cedar-Hardwood Mixed Forest (FOM7-2) and Dry-Fresh Oak-Hardwood Deciduous Forest (FOD2-4)) are present which provide a diversity in vegetation community types. This area of mature swamp and associated upland forest constitutes the highest quality feature within the study area. Any grading or vegetation removal that impacts this feature could result in a proliferation of invasive species, degradation of wildlife habitat and impacts to conservative wetland plant species.

Also shown on Map 2c, a node of Mineral Thicket Swamp (SWT2), Mineral Meadow Marsh (MAM2), and culturally-influenced woodlands (CUW1) are present on both sides of the road near the entrance to the Glen Cairn Golf Club. These features are relatively small and immediately adjacent to the roadside. European Reed (*Phragmites australis* ssp. *australis*), a problematic invasive species, is present through sections of the roadside ditch and the habitats are of moderate to low quality and diversity. A tributary to Middle Sixteen Mile Creek originates within this cluster of SWT2 wetlands. These features are located at the southern extent of a 750m stretch of natural cover that extends to the northern limit of the study area.

The northern extent of the study area (Map 2d) includes a variety of upland forest cover types including deciduous and mixed stands (e.g., Fresh-Moist Poplar Deciduous Forest (FOD8-1), Dry-Fresh Sugar Maple-Hickory Deciduous Forest (FOD5-5), Dry-Fresh Sugar Maple-Hemlock Mixed Forest (FOM3-2)) and naturalized conifer plantations (e.g., Dry-Fresh White Pine-Red Pine Coniferous Forest (FOC1-2)). At the crossing of Middle Sixteen Mile Creek at the far northern extent (AHP-005), the road grade is situated approximately 15m above the bottomland and watercourse elevations. The forest cover in this area is moderately diverse and is comprised of a mixture of native hardwoods, planted conifers and invasive species such as Black Locust (*Robinia pseudoacacia*). The meadow marsh (MAM2-2) and shallow marsh (MAS2-1) features within the floodplain include Reed Canary Grass and cattails, and do not appear to contain a high diversity of plant species or ecologically conservative species. Areas adjacent to the marsh communities include low-lying cultural meadow and forest.

5.2.2 Vascular Flora

In total, 130 vegetation species were inventoried within the Regional Road 25 study area. See Appendix II for a complete list of the inventoried species.

One plant SAR, Black Ash (*Fraxinus nigra*), was documented within the study area. Black Ash is designated as Endangered in Ontario (MECP 2026) and is listed as nationally Threatened by COSEWIC (Government of Canada 2026). Greater than five Black Ash trees were observed within the SWM1-1 swamp community west of the road (Map 2c) during the May 31, 2024 site investigation when NRSI biologists had direct access to the property and natural feature. See Map 3 for the specific locations at which Black Ash was documented. Honey Locust, a provincial Species of Conservation Concern (SCC), is present, but is the horticultural thornless variety (*Gleditsia triacanthos* var. *inermis*) and is not considered significant.

Nine species that are considered significant in Halton Region (Varga 2000) were documented, as summarized in Table 3.

Table 3. Regionally significant species inventoried within the Regional Road 25 study area.

Common Name	Scientific Name	Halton Region Status (Varga 2000)	Observation Locations
Hemp Dogbane	<i>Apocynum cannabinum</i>	Uncommon	SWT2
Speckled Alder	<i>Alnus incana</i> ssp. <i>rugosa</i>	Uncommon	SWM1-1, SWM4-1
Virginia Stickseed	<i>Hackelia virginiana</i>	Uncommon	CUS1, FOD4
Purple Avens	<i>Geum rivale</i>	Rare – Known from 5 locations	SWM4-1
Spotted Geranium	<i>Geranium maculatum</i>	Uncommon	FOD4
Common Evening-primrose	<i>Oenothera biennis</i>	Rare – Known from 1 location	FOM2-2, FOD8-1, FOM3-2, SWT2
Yellow Marsh Marigold	<i>Caltha palustris</i>	Uncommon	SWM1-1, SWM4-1
Eastern Cottonwood	<i>Populus deltoides</i>	Uncommon	FOM2-2, FOD4, FOD4-2
Bebb's Sedge	<i>Carex bebbii</i>	Uncommon	SWT2

The coefficient of conservatism (CC) is a value ranging from 0 (low) to 10 (high), which is based on a species' tolerance of disturbance and fidelity to a specific habitat integrity (Oldham et al. 1995). Higher values are assigned to species that have specific environmental growing requirements and are less tolerant of disturbance. Of the 129 inventoried species, five had CC values of ≥ 7 , which are species that are considered very ecologically conservative and are sensitive to disturbance. These five species were collectively documented in the FOM2-2,

FOM3-2, FOM5-1, SWM1-1, and SWM4-1 vegetation communities. Of the 129 species inventoried within the study area, 38 (29%) are non-native to Ontario.

5.2.3 Tree Inventory

In total, 389 trees were inventoried, comprising 40 species. Of the trees inventoried, 214 (55%) are native species and 158 (41%) are non-native species. The most common species are White Ash (*Fraxinus americana*) and Black Locust, each respectively comprising 9% of all inventoried trees. The majority (73%) of trees are in fair or good condition and have an improbable likelihood of failure.

See the Preliminary Tree Inventory Report (NRSI 2025) for more information and details of trees inventoried within the study area.

5.2.4 Birds

In total, 30 bird species were recorded during site investigations. Of these, 24 species exhibited some form of breeding evidence within the study area. See Appendix III for the complete list of bird species recorded within the Regional Road 25 study area.

One bird SAR, Barn Swallow (*Hirundo rustica*), was observed within the study area. Barn Swallow is listed as Threatened under Schedule 1 of the SARA (Government of Canada 2026). Since it is also listed as a provincial species of Special Concern by COSSARO, it is therefore also considered a SCC in Ontario whose habitat may be considered a form of SWH. Barn Swallows were observed foraging over an agricultural field and MAM2-2 meadow marsh community at the south end of the study area as shown on Map 3a. This species was recorded foraging over this habitat during both breeding bird surveys, with four and one individual recorded during each of the first and second survey, respectively. The closest suitable nesting habitat for Barn Swallow is located at least 50m from the Regional Road 25 ROW.

5.2.5 Herpetofauna

Two herpetofauna species (Gray Treefrog (*Dryophytes versicolor*) and Spring Peeper (*Pseudacris crucifer*)) were recorded within the Regional Road 25 study area. These species were recorded at two wetland features within the study area. The southernmost MAM2-2 meadow marsh (Map 2a), as surveyed by station ANR-011, contained a full chorus of calling Spring Peepers during the April survey, while in May and June it contained smaller numbers of calling Spring Peepers and Gray Treefrogs. The SWT2 mineral thicket swamp alongside the

west side of the road as shown on Map 2c (as surveyed by station ANR-010) contained two calling Gray Treefrogs during each of the May and June surveys, and no calling activity during the April survey. No anuran calling activity was recorded within the small Mineral Meadow Marsh (MAM2) feature on the east side of the road, as surveyed by ANR-009 (Map 2c), during any of the anuran surveys.

One location within the study area, the MAM2-2 meadow marsh at the south end of the study area (Map 1a), was surveyed for the presence of basking turtles (station TB-001). No turtles were observed within that wetland over the course of five turtle basking surveys. No other suitable turtle basking habitat was observed elsewhere within the study area. However, see Section 6.7 in regards to background information on turtle species presence provided by Conservation Halton.

See Appendix IV for the complete list of herpetofauna species recorded within the Regional Road 25 study area.

No suitable *Ambystoma* salamander habitat was documented within the study area. Suitable habitat for the SAR Jefferson Salamander and Unisexual *Ambystoma* salamanders is therefore considered absent within the Regional Road 25 study area. However, SCA-protected habitat for Jefferson Salamander and Unisexual *Ambystoma* salamanders includes areas within 300m of the high-water mark of a breeding pond, wetland or other aquatic feature. Since the presence of breeding habitats within 300m of the study area cannot be ruled out, SCA-protected habitat for Jefferson Salamander and Unisexual *Ambystoma* may extend into the study area despite the absence of suitable breeding habitat within the study area itself. Further, due to the potential presence of suitable habitats to the west and east of the study area, there is potential for Jefferson Salamanders and Unisexual *Ambystoma* salamanders to travel through the study area, including across the Regional Road 25 ROW. See Section 6.4.2 for further discussion about potential SAR habitat presence for these species.

5.2.6 Mammals

Bats

One candidate bat roosting habitat tree was documented within a MAM2 meadow marsh inclusion on the west side of the road where shown on Map 3c (RST-021). This tree was a dead 27cm DBH White Ash that contained a crack/crevice and loose bark that could potentially

be used for bat roosting. This tree therefore represents potential roosting habitat for the SAR Little Brown Myotis, Northern Myotis and/or Silver-haired Bat.

No other suitable roosting habitat trees were observed within the wooded natural feature edges that face the road ROW and could be inspected. However, the roadside wooded natural features that could not be fully explored must be considered potential habitat for all six bat SAR that have potential to occur in the study area (see Appendix V).

Other Mammal Species

Six mammal species were observed within the study area during site investigations. All mammal species that were observed are common species with secure populations in Ontario (MNRF 2021b). See Appendix VI for the complete list of mammal species recorded within the Regional Road 25 study area.

5.2.7 Insects

Two butterfly species (Clouded Sulphur (*Colias philodice*) and Mourning Cloak (*Nymphalis antiopa*)) were documented within the study area during site investigations. No odonate species were incidentally documented during site investigations.

See Appendices VII and VIII for the complete list of butterfly and odonate species, respectively, recorded within the Regional Road 25 study area, including species with previous occurrence records in the study area vicinity (up to approximately 10km) (Macnaughton et al. 2023, OOAD 2023).

5.3 Aquatic Features

5.3.1 Middle Sixteen Mile Creek

Middle Sixteen Mile Creek represents the largest and most significant watercourse within the study area, with this segment originating northwest of the study area. Middle Sixteen Mile Creek was assessed at two general locations (AHP-002 and AHP-005) along the Regional Road 25 ROW (Map 2). Within the study area, Middle Sixteen Mile Creek is characterized as a permanent, coldwater feature providing direct fish habitat by the OMNR (OMNR 2025b). The watercourse flows generally southeast within a meandering channel over a low gradient with riffle, run, and pool habitats throughout. The wetted width at the time of the survey ranged from 3.0-4.8m and the bankfull width ranged from 4.5-5.5m.

Substrates throughout Middle Sixteen Mile Creek were relatively consistent, characterized by a mixture of sand, silt, detritus, cobble, and gravel, with finer sediments generally more prevalent in areas of slower water velocity such as shoreline and backwater habitats (pools), where deposition could occur. Coarse woody debris was present throughout various habitat types in the watercourse. In-stream vegetation was limited primarily to submergent Curly-leaved Pondweed (*Potamogeton crispus*) and floating Duckweed (*Lemna sp.*). Cover and refuge was also afforded by bank undercutting and larger substrates in addition to the woody debris and aquatic vegetation.

The road grade of the northern crossing of Middle Sixteen Mile Creek (AHP-005) is situated approximately 15m above the bottomland and watercourse elevations. Evidence of previous watercourse channel restoration was observed upstream of the road crossing within AHP-005; however, it is dated and consists primarily of gabion baskets.

Based on background information review, a total of 19 species of fish have been identified within this section of Middle Sixteen Mile Creek, including one SAR fish (OMNR 2025a, b, DFO 2024). Redside Dace (*Clinostomus elongatus*) is listed as Endangered both federally and provincially, and has been reported from the vicinity of the study area, but do not contain records within any watercourses along this reach of Regional Road 25. Suitable habitat for this species does not exist within the study area. No fish community sampling was completed within the watercourse as a result of recent survey data availability; however, small-bodied fish, including fry (i.e., young fish) were observed within several locations of Middle Sixteen Mile Creek. A full list of fish species reported from the study area is provided in Appendix IX.

5.3.2 Tributary to Middle Sixteen Mile Creek

A tributary to Middle Sixteen Mile Creek originates within Mineral Thicket Swamp (SWT2) wetlands as shown on Map 2c. This watercourse (AHP-004) is ephemeral in nature and was observed to be hydrologically disconnected from Middle Sixteen Mile Creek at the time of the survey. As such, this feature does not provide suitable direct fish habitat.

6.0 Natural Environment Significance and Sensitivity

Analysis of the significance of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. This assessment also considered the policies and legislation that apply to the study area natural features which must be considered in the evaluation of the road ROW preliminary design. The following summarizes significant and sensitive natural features and habitats present within the study area which may represent development constraints and were considered as part of the selection of a preferred alternative design for the proposed undertaking. Policy-based constraints were identified in accordance with the applicable Provincial land use plans, and the Halton Region and Town of Halton Hills OPs, as summarized in Section 3.0. This assessment incorporates background information review results as well as NRSI field survey results.

6.1 Significant Woodland

Significant Woodlands represent a type of “Key Feature” within Halton Region’s NHS (Halton Region 2024). Significant Woodlands also fall within the “Greenlands B” designation, which forms part of the Halton Hills NHS (Town of Halton Hills 2024). Significant Woodlands are not specifically mapped within the Regional and Town Official Plans (OP), but are mapped as components of the Regional NHS (ROP Map 1) and Key Features of the NHS (ROP Map 1G). In the context of the study area, the Key Features mapped in ROP Map 1G are interpreted to represent Significant Woodlands. Section 277 of the Regional OP defines Significant Woodlands according to the following criteria:

- A woodland that is 0.5ha in size or larger and meets at least one of the following criteria:
 - o The woodland contains forest patches over 99 years old;
 - o The patch size of the woodland is 2ha or larger if it is located in the Urban Area, or 4ha or larger if it is located outside of the Urban Area but below the Escarpment Brow, or 10ha or larger if it is located outside the Urban Area but above the Escarpment Brow;
 - o The woodland has an interior core area of 4ha or larger, measured 100m from the edge; or,
 - o The woodland is wholly or partly within 50m of a major creek or certain headwater creek or within 150m of the Escarpment Brow (Halton Region 2024).

Section B1.3.5 of the Town OP refers to the Regional OP criteria in identifying Significant Woodlands.

See Map 3 for the locations of Significant Woodlands within the study area that were identified based on the Regional criteria. These Significant Woodlands are located within the central and northern sections of the study area, and were identified as significant based on their contiguous size and/or because they were located adjacent to a watercourse. The dripline boundaries of Significant Woodlands, where they face the ROW, were field-delineated by NRSI biologists and surveyed by Tham Surveying as shown on Maps 2 and 3.

In accordance with Section 117.1 of the Regional OP, subject to other applicable provincial policies (e.g., NEP, Greenbelt Plan), “essential transportation and utility facilities” are permitted within the Regional NHS, including Key Features such as Significant Woodlands. Essential transportation and utility facilities are also permitted within Key Features of the Greenbelt NHS, including Significant Woodland, as per Section 139.3.7. However, infrastructure development is still subject to Section 118.2 (b) of the Regional OP, which states that alteration of Regional NHS components are not permitted unless it has been demonstrated that there will be no negative impacts on the natural features and areas or their ecological functions. Similarly, Section B.1.3.2.2 of the Town’s OP states that “transportation and utility facilities” are a permitted use within “Greenlands B” features, which include Significant Woodlands. However, there must be regard for the significant natural features insofar as all efforts are made to avoid, or otherwise minimize and sufficiently mitigate impacts to the natural features. Under the policies of the NEP and the Greenbelt Plan, infrastructure development is permitted within Key Natural Heritage Features where the project has been deemed necessary to the public interest and there is no other alternative (OMMA 2017, MNRF 2021a).

6.2 Wetlands

Provincial LIO mapping identifies the presence of the evaluated, non-provincially significant Chudleigh Swamp within the study area (MNRF 2024). The Chudleigh Swamp corresponds to the SWM1-1/SWM4-1 swamp complex, with MAM2-2 meadow marsh inclusions, that spans the west and east sides of Regional Road 25 as shown on Map 3c. Based on background information that was requested from the OMNR, it is understood that the Chudleigh Swamp may be considered a Provincially Significant Wetland (PSW) if it were to be re-evaluated, as it may contain provincially or regionally significant species (S. Varga, MNRF, pers. comm., September 2023). Since receiving that information, NRSI biologists did confirm the presence of the SAR

Black Ash within the SWM1-1 community component of the Chudleigh Swamp. Since an updated wetland evaluation under the Ontario Wetland Evaluation System (MNRF 2022) was outside the scope of this study, following a precautionary approach and for the purposes of this study, the Chudleigh Swamp complex is treated as a PSW despite it not being formally recognized as a PSW. Swamp vegetation communities that comprise the Chudleigh Swamp have also been identified as a Significant Woodland as shown on Map 3c.

Through completion of the NRSI fieldwork, wetland mapping was produced for the study area (Map 3) based on ELC classification (Lee et al. 1998) and on-site wetland boundary confirmation with Conservation Halton staff. This mapping updates and refines existing online Conservation Halton wetland mapping for the study area (Conservation Halton 2024a). For example, NRSI identified previously-unmapped roadside wetland features (e.g., SWT2 communities shown on Map 3c, MAM2-2 community mapped along the west side of the road on Map 3b), while the forest complex containing the FOM2, FOM2-1, FOD8-1, FOC1-2, and FOD7 communities, within the Glen Cairn Golf Club property (Map 3d), were confirmed to not represent wetland. The study area therefore contains wetlands that are mapped and regulated by Conservation Halton and wetlands that are not currently included in Conservation Halton regulation mapping. See Map 4 for a comparison of wetlands that are currently regulated by Conservation Halton, along with Conservation Halton regulation limits, and wetlands identified during the study that are not currently mapped by Conservation Halton. Map 4 also illustrates the currently-regulated wetlands as they are shown on Conservation Halton mapping; these are shown to compare with refined wetland limits identified during the study through ELC and roadside wetland boundary confirmations.

Section 118.2(a) of the Regional OP states that development and site alteration is prohibited within Significant Wetlands; no exception for essential transportation infrastructure is included. The Region's definition of Significant Wetland varies depending on whether or not the wetland falls within a Provincial plan area. As per Section 276.5 of the Regional OP, Significant Wetlands are defined as the following:

- Within the NEP area: PSWs and wetlands as defined in the NEP area that make an important ecological contribution to the Regional NHS.
 - o Within the study area, this comprises the MAM2 and MAM2-2 wetlands at the far north end of the study area, west of the ROW (Map 3d)

- Within the Greenbelt Plan area but outside of the NEP area: PSWs and wetlands as defined in the Greenbelt Plan.
 - o Within the study area, this comprises the small MAM2-2 inclusion east of the ROW shown on Map 3b; wetlands within the Chudleigh Swamp complex (SWM4-1, SWT2 and MAM2 communities) and the MAM2-2 and SWT2 wetlands associated with the golf course property to the east of the ROW as shown on Map 3c; and the MAM2-2, MAS2-1, and the FOM/SWM complex with SA inclusion at the far north end of the study area, east of the ROW, as shown on Map 3d.
- Within the Regional NHS but outside of the Greenbelt Plan area: PSWs and wetlands that make an important ecological contribution to the Regional NHS.
 - o Within the study area, this comprises wetlands within the Chudleigh Swamp complex (SWM1-1 and MAM2-2 communities), and SWT2 with MAM2 inclusions, located to the west of the ROW as shown on Map 3c
- Outside of the Regional NHS: PSWs.
 - o This category does not apply to the study area.

Similarly, Section B1.2.5 of the Town OP states that development within Significant Wetlands is prohibited, with no exception for essential infrastructure. The Town OP does not define “Significant Wetlands”, so for these purposes they are defined in accordance with the Regional criteria.

Key Features of the Regional NHS include Significant Wetlands as well as non-significant wetlands. See Map 3 for the location of Significant Wetlands. The MAM2-2 and MAS2-1 wetlands on the west side of Regional Road 25 as shown on Maps 3a and 3b fall outside of the NEP and Greenbelt Plan areas; because they are relatively low quality wetlands and do not make an important ecological contribution to the Regional NHS, they are not considered Significant Wetlands.

Wetlands are also regulated as hazard features by Conservation Halton, in accordance with Ontario Regulation 41/24 pursuant to the *Conservation Authorities Act*. Development and site alteration is prohibited in regulated areas unless permitted by Conservation Halton.

6.3 Watercourses and Fish Habitat

Permanent, direct fish habitat was identified for Middle Sixteen Mile Creek within the study area, corresponding to AHP-002 and AHP-005 (Maps 2c and 2d). This watercourse has a coldwater thermal regime, and therefore provides habitat for thermally-sensitive coldwater fish species. No aquatic SAR have been identified as occupying this or any other study area watercourse.

Section 118.2(a) of the Regional OP states that development and site alteration is prohibited within fish habitat, except in accordance with Provincial or Federal legislation or regulations.

Fish habitat is also regulated under the federal *Fisheries Act*, as administered by Fisheries and Oceans Canada (DFO). Any activities that may cause the “harmful alteration, disruption or destruction” (HADD) of fish habitat will require review by DFO staff to determine if an authorization under the *Fisheries Act* is required.

Watercourses, regardless of the presence of fish habitat, including their associated floodplains, are also regulated as hazard features by Conservation Halton, in accordance with Ontario Regulation 41/24. Development and site alteration within watercourses, such as at road crossing locations, is prohibited unless permitted by Conservation Halton.

6.4 Species at Risk

An assessment of SAR presence/absence was completed based on the results of background information review and field surveys. Based on these results, one SAR, Black Ash, was confirmed to occur within the study area. Potential habitat for the SAR Jefferson Salamander and Unisexual Ambystoma salamanders was generally identified as having potential to occur within the study area. Potential habitat for the SAR bats Little Brown Myotis, Northern Myotis, Tri-colored Bat, Silver-haired Bat, Hoary Bat, and Eastern Red Bat was also identified for wooded natural features in the study area.

See Appendix V for a summary of the SAR/SCC habitat assessment that was completed for the study area, including whether the species has been confirmed or has potential to occur within the study area.

6.4.1 Confirmed Habitats

Black Ash

Black Ash is a facultative wetland species that is typically found in swamps, fens, floodplain forests, and shorelines, and occasionally in moist depressional areas of upland forests (Catling

et al. 2022). Greater than five Black Ash trees were documented within the SWM1-1 mixed swamp community that comprises a part of the Chudleigh Swamp complex. These trees were observed clustered within two general areas; these two observation locations are shown on Map 3c.

Ontario Regulation 6/24 specifies that protections to Black Ash only apply to 'healthy' Black Ash trees that have a diameter-at-breast-height (DBH) of at least 8cm. 'Healthy' trees represent those that appear to have survived exposure to Emerald Ash Borer and have been assessed to be healthy by a qualified professional. Since the specific DBH and the health of the observed trees were not assessed as part of the field surveys, the observed trees are all assumed to represent ESA-protected trees.

Ontario Regulation 7/24 further specifies that the habitat protection for Black Ash comprises the area within a 30m radial distance around the Black Ash trees. Protected habitat zones of 30m radius are shown around each of the two general Black Ash observation locations. However, these should be considered approximated since the locations of individual trees were not surveyed. Therefore, following a precautionary approach, the entire SWM1-1 swamp community in which the Black Ash trees were documented should be considered habitat for the species until such time that more detailed Black Ash locational data is collected to identify accurate 30m habitat protection zones. Confirmed SAR Black Ash habitat associated with the SWM1-1 community is shown on Map 3c. Negative impacts to the habitat, as a result of road improvement activities, are prohibited unless permitted by the Ontario Ministry of the Environment, Conservation and Parks (MECP) or otherwise undertaken as a registrable activity in accordance with Ontario Regulation 75/26.

6.4.2 Potential Habitats

Jefferson Salamander and Unisexual Ambystoma Salamanders

Suitable breeding habitat for Jefferson Salamanders and Unisexual Ambystoma salamanders was not observed within the study area based investigations of natural features where property access was permitted, or otherwise what was viewed from the ROW or identified from aerial photo interpretation. However, SCA-protected habitat for these species includes the breeding pond, wetland or aquatic feature plus adjacent lands within 300m of the 5-year high-water mark of the breeding habitat. This surrounding 300m zone is used by salamanders for overwintering and is important to maintaining the ecological integrity and suitable characteristics of the breeding habitat (e.g., thermal regime of the pond). Since the presence of suitable breeding

habitats within 300m of the study area cannot be ruled out, following a precautionary approach, it is assumed that SCA-protected habitat for Jefferson Salamander and Unisexual Ambystoma may extend into the study area. This habitat would represent wooded natural features (e.g., woodland, thicket or treed swamp communities) that may be used by these salamander species for overwintering, with breeding habitats themselves being located outside of the study area. Since the precise locations of these potential habitat areas are not known and could comprise a wide range of areas, they are not specifically shown on Map 3. Further consultation with the MECP at the Detailed Design stage will be required to determine whether detailed habitat mapping for these species is available for the study area.

Movement habitat for Jefferson Salamanders and Unisexual Ambystoma salamanders that is outside of the habitat zone described above is not protected under the SCA. However, movement corridors for these species must be maintained and protected to preserve the long-term viability of local populations. There is also potential that the SCA-protected habitat zone may include the Regional Road 25 ROW, which would include associated cross-road habitat connectivity. See Section 6.7 for further discussion about Jefferson Salamander and Unisexual Ambystoma salamanders in the context of Ecological Linkages.

Species at Risk Bats

A single candidate bat roosting habitat tree was documented within a MAM2 meadow marsh inclusion on the west side of the road where shown on Map 3c. Little Brown Myotis, Northern Myotis, and Silver-haired Bat are known to utilize trees that contain suitable cracks, crevices and loose/peeling bark for maternity colony and roosting habitat (Humphrey and Fotherby 2019, COSEWIC 2023). This tree therefore represents potential habitat for these SAR bats. Removal of this tree must be avoided unless it is determined that its removal would not negatively impact SAR bats. Furthermore, measures must be taken in removing the tree to ensure that individual SAR bats (or other non-SAR bats) are not killed, harmed or harassed during construction of the road works (see Section 7.3.2).

Although the ROW-facing edges of the wooded natural features were investigated for the presence of suitable bat roosting habitat trees (for Little Brown Myotis, Northern Myotis, Tri-colored Bat and Silver-haired Bat), and no other suitable habitat trees were identified, the majority of the study area wooded features could not be fully investigated as part of this study. The adjacent wooded natural features (i.e., the forest (FO), treed swamp (SWM) and cultural woodland (CUW) ELC classifications) must therefore be assumed to represent potential habitat

for these SAR bats. Furthermore, as described in Section 4.7, the bat habitat assessment fieldwork pre-dated the listing of Hoary Bat and Eastern Red Bat to the SARO list (which has since been supplanted by the Protected Species in Ontario list (MECP 2026)), which have differing roosting habitat preferences. For example, Hoary Bat and Eastern Red Bat roost alone or with their pups, and often make use of supercanopy trees or sun-exposed woodland edges with a south-facing aspect (COSEWIC 2023). Since these potential roosting characteristics were not specifically documented during site investigations, the forest, treed swamp and cultural woodland vegetation communities must also be considered potential habitat for the SAR Hoary Bat and Eastern Red Bat.

Road infrastructure development and grading into these adjacent wooded natural features should therefore be avoided to avoid impacts to bat SAR and their habitats. Where encroachment into these features is required and where impacts may occur, the need for permitting or otherwise actions in accordance with Ontario Regulation 75/26 may be required. Measures must also be taken in removing the tree to ensure that individual SAR bats (or other non-SAR bats) are not killed, harmed or harassed during construction of the road works (see Section 7.3.2).

Barn Swallow

Barn Swallow is listed as Threatened under Schedule 1 of the SARA (Government of Canada 2026). This species was observed foraging over agricultural lands at the south end of the study area (see Maps 3a and 3b) during both breeding bird surveys, with up to four individuals observed at one time. Section 33 of the SARA prohibits damaging or destroying the “residence” of a listed Threatened, Endangered or Extirpated species. Under the SARA, the residence of Barn Swallows is defined as the nest itself. The nests and nesting habitat of Barn Swallows are located well outside of the Regional Road 25 ROW, and are likely located in one of the nearby barns. Since the proposed undertaking will not damage or destroy the residence of Barn Swallows, no impacts to Barn Swallow in contravention of the SARA will occur. Barn Swallow is therefore not considered further in this report in the context of SAR; however, see below with respect to SWH.

6.4.3 Other Species at Risk Records

Appendix V lists SAR that have occurrence records in the study area vicinity (up to 10km) based on review of background information sources. An assessment of habitat suitability was completed for these species based on a review of each species’ habitat requirements (e.g.,

OMNR 2000) versus habitat availability within the study area as confirmed through site investigations. Of species that have suitable or potentially suitable habitats within the study area, an assessment was made of their likelihood of occurrence based on the completion of field surveys in the study area. Based on this assessment, other SAR that were identified with records in the study area vicinity are considered unlikely to occupy habitats in the Regional Road 25 study area, or at least in the habitats that could be impacted adjacent to the ROW. Suitable habitats for these other SAR are therefore considered absent in the study area.

6.5 Significant Wildlife Habitat

A SWH assessment was completed based on the results of background information review and field surveys. Based on these results, one form of SWH was confirmed to occur within the study area:

- Habitat for Special Concern and Rare Species – Barn Swallow

Candidate/possible SWH types were also identified, due to the presence of confirmed or potential suitable habitat and because they could not be ruled out based on the field surveys completed. These included the following:

- Bat Maternity Colonies
- Snake Hibernaculum Habitat
- Marsh Bird Breeding Habitat (Green Heron (*Butorides virescens*) habitat)
- Seeps and Springs
- Habitat for multiple other Special Concern and Rare Species

See Appendix X for a summary of the SWH assessment that was completed for the study area, including rationale describing whether a SWH category is considered confirmed, candidate, possible, or not present within the study area.

In accordance with Section 117.1 of the Regional OP, subject to other applicable provincial policies (e.g., NEP, Greenbelt Plan), “essential transportation and utility facilities” are permitted within the Regional NHS, including Key Features such as SWH. Essential transportation and utility facilities are also permitted within Key Features of the Greenbelt NHS, including SWH, as per Section 139.3.7. However, infrastructure development is still subject to Section 118.2 (b) of the Regional OP, which states that alteration of Regional NHS components are not permitted

unless it has been demonstrated that there will be no negative impacts on the natural features and areas or their ecological functions. Similarly, Section B.1.3.2.2 of the Town's OP states that "transportation and utility facilities" are a permitted use within "Greenlands B" features, which includes SWH. However, there must be regard for the significant natural features insofar as all efforts are made to avoid, or otherwise minimize and sufficiently mitigate impacts to the natural features. Under the policies of the NEP and the Greenbelt Plan, infrastructure development is permitted within Key Natural Heritage Features (which includes SWH) where the project has been deemed necessary to the public interest and there is no other alternative (OMMA 2017, MNRF 2021a).

6.5.1 Confirmed Significant Wildlife Habitat

Habitat for Special Concern and Rare Species - Barn Swallow

Barn Swallow is designated as a species of Special Concern in Ontario (MECP 2025), and is therefore considered a SCC (OMNR 2010). This species was observed foraging over meadow marsh and agricultural land at the south end of the study area (Map 3a) during both breeding bird surveys, with up to four individuals observed using the habitat. In defining the habitat of the species, the previously defined general habitat description that was used when species was regulated as a SAR (MNRF undated) was used. This description identifies habitat for the species as comprising lands up to 200m from a nesting site, with the foraging habitat being recognized as being relatively tolerant to development-related alterations. The specific nesting site of the observed Barn Swallows is not known, but due to the presence of nearby potential nesting structures (e.g., sheds, agricultural outbuildings), it is conservatively assumed that the observed foraging Barn Swallows were within 200m of their nesting site. For this reason, the open foraging habitat (Map 3a) is considered a form of SWH.

6.5.2 Candidate/Possible Significant Wildlife Habitat

Bat Maternity Colonies

Woodlands within the study area were not investigated for their potential to provide bat maternity colony habitat as part of this study. Woodlands may be identified as Candidate SWH when they meet a threshold of >10 large-diameter (>25cm DBH) trees/ha (MNRF 2015a). There is potential that certain more mature woodlands within the study area (e.g., Chudleigh Swamp) may meet that threshold. However, since this SWH category was not evaluated as part of the study scope, all forest (FO) and treed swamp (SWM) communities, as defined by

ELC, are considered potential SWH for Bat Maternity Colonies following a precautionary approach.

Snake Hibernaculum

Snake hibernacula are typically difficult to identify from the surface, but could include features such as rock fissures and outcroppings, old stone foundations or walls, wells, or mammal burrows. Targeted surveys to assess the presence of snake hibernacula were outside the scope of this study. While this habitat function cannot be ruled out for the study area as a whole, no surface features that are indicative of good quality snake hibernaculum habitat were observed in immediate roadside areas that could potentially be impacted by the undertaking. Therefore, this Candidate SWH type is not considered further in this report.

Marsh Bird Breeding Habitat

Green Heron represents an indicator species for this SWH category, whereby a wetland with one confirmed breeding pair of Green Herons would be considered significant (MNRF 2015a). One individual was observed within the SWM4-1 swamp community east of the ROW, part of the larger Chudleigh Swamp complex. This individual was observed during one of the breeding bird surveys, which represents “possible” evidence for breeding according to the OBBA (Birds Canada et al. 2021). Following a precautionary approach, the SWM4-1 community is therefore considered Candidate SWH for Marsh Bird Breeding Habitat due to its potential use as Green Heron breeding habitat.

Seeps and Springs

The study area is located in an upper headwaters area of the Middle Sixteen Mile Creek watershed. As such, there is potential that groundwater seepages, that are of potential value to wildlife species, may occur within forested habitats within the study area. The characterization of Middle Sixteen Mile Creek within the study area as a coldwater feature is indicative of significant groundwater contributions to its base flow. Fulsome investigations of the study area natural features for the presence of groundwater seeps and springs was not undertaken as part of the fieldwork scope. Following a precautionary approach, study area forest communities (FO), as identified through ELC, should be considered Candidate SWH for Seeps and Springs. However, based on roadside and on-property forested areas that were investigated during field surveys, no significant seepage areas were identified that could be impacted by the proposed undertaking. For this reason, this Candidate SWH is not considered further in the report.

Special Concern and Rare Wildlife Species

Multiple other Special Concern or provincially rare (i.e., NHIC S1-S3 ranked species; MNRF 2021b) were identified for the study area as having potential to occur in the study area as described in Appendix V. These mainly comprise butterfly and odonate species that have records of occurrence in the study area vicinity (Macnaughton et al. 2023, OOAD 2023) but for which targeted surveys were not completed. Collectively, these species may occur across the majority of the study area's natural features, but particularly woodland and riparian habitats for multiple species. The SCC Snapping Turtle (*Chelydra serpentina*) was also identified as having potential to occur within the study area, particularly within the Chudleigh Swamp that forms part of a broader ecological corridor that follows Middle Sixteen Mile Creek. NRSI biologists did not observe Snapping Turtles during site investigations within the study area. However, this species was previously documented within the vicinity of the study area based on background information provided to NRSI by Conservation Halton (2023a).

6.6 Regionally Significant Vegetation Species

As listed in Section 5.2.2, nine regionally uncommon or rare vegetation species (Varga 2000) were inventoried during field surveys. The majority of these individuals were identified close to the road and will therefore require consideration within the impact assessment and associated avoidance or mitigation measures. These species collectively occurred across a wide variety of the study area's natural vegetation communities, predominantly in forest and swamp features.

While regionally rare vegetation species in and of themselves do not represent policy-based constraints to road design or construction, their presence renders additional significance to the features in which they are located. Measures should be taken to avoid impacts to regionally significant vegetation and to protect individual plants during construction where necessary. If impacts cannot be avoided, the individual plants should be relocated to an appropriate site when feasible.

6.7 Ecological Linkage

Maintaining the interconnectedness of Key Features and their ecological functions via continuous natural corridors is identified as an objective of the Regional NHS (Halton Region 2024). This recognizes the systems-based approach to protecting the natural features and functions of NHS, and is also reflected in the goals and policies of the Greenbelt Plan, NEP, and the Halton Hills OP (OMMA 2017, MNRF 2021a, Town of Halton Hills 2024). Linkages are critical to the effective movement of wildlife across the landscape accessing different habitats, in

the exchange of genetic material (e.g., dispersal of plant seeds), and in promoting dispersal and recruitment among subpopulations (e.g., amphibians) among other functions. Linkages are therefore important to maintaining the ecological integrity and health of a broader NHS, such as in protecting biodiversity. In recognition of these benefits, the Regional OP identifies Linkages as a component of the Regional NHS.

In the context of the study area, the primary Linkage represents the broadly wooded natural corridor that follows Middle Sixteen Mile Creek. This is a significant landscape-level corridor in the study area vicinity, which has some degree of connectivity to the natural Niagara Escarpment Lands to the west. At a more local scale, this natural Linkage principally crosses Regional Road 25 at the two watercourse crossings, those being at the far north end of the study area and more southerly at the location of the Chudleigh Swamp complex.

For the purposes of road improvement Preliminary Design considerations, of key importance is the maintenance of wildlife movement connectivity across the road. Based on existing information, the Chudleigh Swamp portion of the broader landscape Linkage, as well as the wooded features at the north end of the study area, likely function as important movement corridors, with Regional Road 25 bisecting good quality habitats to the east and west.

Background information provided by Conservation Halton (2023) indicated the presence of multiple herpetofauna species within the vicinity of the Regional Road 25 study area. Although the georeferenced wildlife species occurrence data points provided by Conservation Halton were confirmed to not necessarily represent accurate observation locations (e.g., due to limited locational information provided along with wildlife species records submitted to Conservation Halton by members of the public) (H. Anderson, Conservation Halton, pers. comm., October 2024), it can be assumed that the herpetofauna species included in the background data submission may occur within the Chudleigh Swamp and nearby wetland features. These species include the SCC Snapping Turtle, as well as American Toad (*Anaxyrus americanus*), Northern Leopard Frog (*Lithobates pipiens*), Green Frog (*Lithobates clamitans*), and Eastern Gartersnake (*Thamnophis sirtalis sirtalis*). The ROW crossings of Middle Sixteen Mile Creek, within the Chudleigh Swamp complex and between the wooded features at the north end of the study area, may therefore represent important crossing points for wildlife. Herpetofauna species are particularly vulnerable to road mortality impacts where they must cross roads to access available habitats. Based on this information, and due to the local landscape context and high quality habitats of the Chudleigh Swamp and northern study area natural features,

these portions of the broader Linkage are identified as locally important Wildlife Movement Corridors on Maps 3c and 3d.

Jefferson Salamander and Unisexual Ambystoma salamanders, which are also known to inhabit the general vicinity of the study area (MNR 2025a, Conservation Halton 2023), may also cross the study area natural features, including the Regional Road 25 ROW. Jefferson Salamanders are known to travel across a wide variety of terrestrial land cover types during breeding migration movements, including woodlands, plantations, agricultural fields, early successional areas, and across roads, and are known to travel up to 1km from the breeding pond (Linton et al. 2018). Although salamander dispersal from breeding ponds may not be strictly aligned to wooded riparian corridors, within the study area they are more likely to cross where natural features such as woodlands and wetlands occur on both sides of the road. The Chudleigh Swamp and north study area wooded features therefore represent the most likely crossing locations for these species if they move through the study area.

7.0 Impact Assessment

7.1 Description of Proposed Works

The Preliminary Design for improvements to Regional Road 25 was differentiated between two segments (5 Sideroad to the Chudleigh Entertainment Farm; and the Chudleigh Entertainment Farm to 10 Sideroad), due to the determination of varying future needs for these two road segments (e.g., difference in traffic volume and multi-modal transportation requirements). The Preliminary Design also accounted for the planned installation of a round-about at the 5 Sideroad/Regional Road 25 intersection, which has been planned as part of a separate municipal project.

The proposed undertaking will require localized widening of the permanent road footprint in various locations along the study area length of the ROW to accommodate the planned improvements. Roadside grading will also be required in certain locations to account for refinements in vertical road elevations and to match existing grades along roadside. Road widening and grading requirements have been avoided or minimized in various locations of the ROW that are considered constraints, such as along certain natural feature edges, at the entrance to Chudleigh's Entertainment Farm, and along residential driveway entrances. The existing box culvert (Culvert C-2) that conveys Middle Sixteen Mile Creek under Regional Road 25 will not require extension or replacement, and the existing structure will be left in place as part of the road improvements. A culvert located further to the south (Culvert D), which conveys a headwater drainage feature (HDF), will require extension to accommodate the proposed widening.

The 5 Sideroad to Chudleigh's Entertainment Farm road segment will include 3.65m wide northbound and southbound travel lanes (two lanes total), a continuous 4.0m wide two-way left-turn lane, 3.0m wide paved shoulders, and a multi-use path along the west side of the road that ranges from 2.4 – 3.0m wide. Grassed drainage swales will be located along both sides of the road; a swale will separate the multi-use path from the road platform on the west side.

The Chudleigh's Entertainment Farm to 10 Sideroad road segment will include 3.65m wide northbound and southbound travel lanes (two lanes total), 3.0m wide paved shoulders. Discontinuous 3.65m wide right- and left-hand turn lanes will be incorporated at the entrance to Glen Cairn Golf Club and at the intersection with 10 Sideroad. This road segment will not include a multi-use path.

See Appendix XI for the Regional Road 25 Preliminary Design (HDR 2024). Map 5 illustrates the Preliminary Design as overlaid on to the existing natural features.

7.2 Approach to Impact Assessment

The assessment of potential impacts was determined by comparing the details of the preferred Preliminary Design with the characteristics of the existing natural features and their functions. The outcome of this process was based primarily on the resilience of the identified natural features and functions to withstand predicted disturbances caused by design, construction and operation of the transportation infrastructure. In this manner, both the significance and sensitivity of the affected natural features and functions to disturbance were considered. The following is a description of the types of impacts which will be discussed.

- Direct Impacts – associated with the disruption or displacement of natural features, caused by the actual “footprint” of the undertaking;
- Indirect Impacts – associated with changes in site conditions such as drainage and water quantity/quality, and construction-stage disturbances to the adjacent features; and,
- Induced Impacts – associated with human-induced disturbances imposed on the existing study area natural features and ecological functions during post-construction operation of the infrastructure.

7.3 Direct Impacts

7.3.1 Vegetation Removal and Site Grading

Characterization of natural feature significance and sensitivity, and delineation of feature boundaries, informed the Preliminary Design such that impacts to these features were avoided or minimized. Roadside grading limits are expected to extend into the outer edges of certain study area natural features. These will include non-significant Reed Canary Grass Mineral Meadow Marsh (MAM2-2) and Cattail Mineral Shallow Marsh (MAS2-1) wetland features at the south end of the study area, west of the road (Maps 5a-c), and regionally significant wetland communities such as the White Cedar Mineral Mixed Swamp (SWM1-1) and Mineral Thicket Swamp (SWT2) communities of the Chudleigh Swamp complex, and additional SWT2 thicket swamp and MAM2 meadow marsh to the north (Maps 5c-g). Woodland edge encroachment effects are expected at the Fresh-Moist Oak-Maple-Hickory Deciduous Forest (FOD9; Map 5c), Dry-Fresh Deciduous Forest (FOD4; Map 5f), as well as the Dry-Fresh Sugar Maple-Hickory Deciduous Forest (FOD5-5) and some woodland communities immediately north of the 10

Sideroad intersection (Map 5g). These impacts will represent relatively minor encroachments into the feature edges, and the majority of these encroachment areas represent graded slopes that will be outside of the impervious road footprint and which can be ecologically restored post-construction. The maximum width of natural feature encroachment is 10.0m, located at the non-significant MAM2-2 meadow marsh to the west of the ROW as shown on Map 5c, while the majority of encroachments are <5m from the existing road footprint. At the level of individual vegetation communities, development encroachments as a proportion of total vegetation community area range from 0.01% (Fresh-Moist White Cedar-Hardwood Mixed Forest (FOM7-2) (Map 5d) to 20.4% (MAM2-2 meadow marsh on west side of ROW (Map 5c)). The following is a summary of development encroachment based on the Preliminary Design as shown on Map 5.

Table 4. Area and Maximum Length of Right of Way Development or Grading Encroachment into Adjacent Natural Features.

Vegetation Community Code	Map Reference	Area of Grading Encroachment Including Road Platform (m ²)	Maximum Length of Grading Encroachment Including Road Platform (m)	Area of Road Platform Development Encroachment (m ²)	Maximum Length of Road Platform Development Encroachment (m)
MAS2-1	Maps 5a/5b	489.0	8.91	47.2	1.82
CUM1-1	Maps 5a/5b	440.3	8.91	36.4	1.21
CUT1-1	Map 5b	64.3	6.39	3.7	0.57
CUM1-1 (west of ROW)	Map 5c	51.8	4.95	0	0
MAM2-2 (west of ROW)	Map 5c	598.4	9.99	576.3	5.65
CUM1-1 (east of ROW)	Map 5c	43.9	4.95	0	0
MAM2-2 (east of ROW)	Map 5c	79.9	3.78	0	0
FOD9	Map 5c	34.3	2.66	0	0
SWT2	Map 5d	100.8	4.20	0	0
SWM4-1	Map 5d	39.0	3.40	0	0
FOM7-2	Map 5d	0.2	0.21	0	0
SWM1-1	Maps 5d/e	432.0	4.99	0	0
MAM2	Map 5e	0.7	1.32	0	0
MAM2-2	Map 5e	0.9	0.36	0	0
SWT2 (west of ROW)	Map 5f	508.5	5.86	0	0
FOD4	Map 5f	219.5	6.02	0	0
FOD4	Map 5g	2.3	1.14	0	0
FOD5-5	Map 5g	500.7	9.32	95.6	2.20
CUP3	Map 5g	423.4	5.94	221.6	3.75
CUP1	Map 5g	200.5	2.52	0	0
CUW1	Map 5g	30.3	4.20	0	0

Vegetation Community Code	Map Reference	Area of Grading Encroachment Including Road Platform (m ²)	Maximum Length of Grading Encroachment Including Road Platform (m)	Area of Road Platform Development Encroachment (m ²)	Maximum Length of Road Platform Development Encroachment (m)
FOM2-2	Map 5g	70.5	3.96	8.0	1.20
FOC4-1	Map 5g	72.1	3.96	13.5	1.47
FOM3-2	Map 5g	70.2	4.84	0	0
MAM2 (west of ROW)	Map 5g	49.4	2.92	0	0

Development encroachment for the purposes of the impervious road infrastructure (e.g., the multi-use path) will be relatively small. The greatest extent of impervious development encroachment will occur at the MAM2-2 wetland at the south end of the study area (Map 5c; west side of the road). At this wetland, the maximum impervious development encroachment extends 5.7m and represents an encroachment area of 577m². Unlike graded slopes, impervious road infrastructure represents a permanent removal of natural land cover. However, this permanent natural feature removal is negligible in relation to the remaining study area natural features for which direct impacts will be avoided, or where grading encroachments can be ecologically restored. It should be noted, however, that while graded roadside slopes will be restored through a minimum of native herbaceous seed mix application (see Section 8.0), full restoration of the area of grading encroachment to replace the previous woody vegetation growth or natural feature edge may not always be feasible, subject to ROW design requirements. A detailed assessment of restoration opportunities along the roadside areas will be determined during the Detailed Design stage.

Although the anticipated impact areas are proportionally small to the overall vegetation community sizes, efforts should be made during the Detailed Design stage to further reduce natural feature encroachment requirements. In particular, revisions to roadside development and grading limits are required where wetland encroachments are proposed to adhere to Regional and Town OP policies prohibiting development and site alteration in Significant Wetlands (see Section 6.2). These revisions must include measures to avoid development and site alteration encroachments within the Chudleigh Swamp and other wetland features located within the north half of the study area (Maps 5d-g). Efforts should also be made to avoid or minimize encroachments into Significant Woodland located at the north end of the study area (Map 5g). By contrast, the non-significant MAM2-2 and MAS2-1 wetland features at the south end of the study area are relatively low quality/low sensitivity features, which largely comprise

monocultures of Reed Canary Grass and cattail, respectively, and are expected to be resilient to disturbance along their edges.

Significant Vegetation Species Impacts

Anticipated grading encroachment into the SWM1-1 swamp community on the west side of the ROW will come into close proximity to one of the two plotted locations of SAR Black Ash growth (Maps 5c-d). Specifically, the grading limits will encroach within the 30m habitat zone of the plotted tree location. Black Ash trees and their 30m habitat zones are protected under the SCA and as described in Ontario Regulation 7/24. However, in accordance with Ontario Regulation 6/24, Black Ash trees or their habitats are not subject to protection if it is determined by a qualified professional that the tree is <8cm DBH, is dead, or is an “unhealthy” tree. Determination of whether a Black Ash is “unhealthy” is to be completed following the *Black Ash Assessment Guidelines: Assessment of Black Ash (Fraxinus nigra) for the purposes of the Endangered Species Act, 2007* (MECP 2024). An updated and detailed inventory and assessment of Black Ash tree growth and health should therefore be completed by a qualified biologist during the Detailed Design stage to confirm whether SCA protections and development constraints apply in this location. Although no Black Ash individuals were observed within the Chudleigh Swamp communities along the east side of the ROW, due to the similarities in suitable habitat conditions and potential for Black Ash establishment it is recommended that the supplemental Detailed Design-stage investigation also include the lands to the east of the ROW. Pending the completion of this additional assessment, at a minimum, the trees and their mapped 30m habitat zones should be considered constraints to road development activities. Following a precautionary approach, since a more detailed inventory of the SWM1-1 community may be required to confirm the locations of any other Black Ash growth, it is recommended that the entire SWM1-1 community be considered a constraint. As stated above, efforts must be made to refine the Detailed Design to avoid impacts to the Chudleigh Swamp wetland communities.

Various other regionally significant vegetation species were inventoried within the study area, including within natural features for which some minor grading encroachment is anticipated (see Section 5.2.2). Measures should be taken to avoid impacts to regionally significant vegetation and to protect individual plants during construction where necessary. If impacts cannot be avoided, the individual plants should be relocated to an appropriate site when feasible.

Alternately, seed can be collected from the plants to be impacted and re-distributed within areas of suitable habitat outside of anticipated future construction zones.

Tree Removal

A preliminary tree removal and retention assessment was completed as described in the Preliminary Tree Inventory Report for Regional Road 25 (NRSI 2025). As summarized in that report, of the 389 inventoried trees, 214 are recommended for removal to accommodate the road improvement Preliminary Design. Many of these trees are in direct conflict with the proposed road construction, or are situated in close proximity to the grading limit and would incur severe root damage as a result of grading. Of these 389 trees to be removed, 33 are assumed to be boundary or off-property trees. The removal of these trees will require the permission of all owners involved. Additional trees less than 10cm DBH may require removal due to conflicts with the proposed undertaking, but these smaller trees were outside the scope of the inventory. See the Preliminary Tree Inventory Report for a more detailed breakdown of anticipated tree retention and removal requirements.

Of the 214 trees to be removed, 23 are dead and are therefore excluded from tree compensation calculations following Regional criteria. Based on the preliminary estimate of 191 live trees to be removed, a total of 855 compensation tree plantings will be required based on application of the Region's Tree Canopy Replacement Policy on Regionally-Owned Lands (Halton Region 2008). See the Preliminary Tree Inventory Report for a more detailed summary of tree compensation requirements. The tree compensation total will be updated and finalized upon completion of the supplementary tree inventory, and updated tree removal/retention analysis, to be completed during the Detailed Design stage.

7.3.2 Impacts to Terrestrial Wildlife and Their Habitats

Potential Species at Risk Bat Habitat and Possible Bat Maternity Colonies Significant Wildlife Habitat

A single potential bat roosting habitat tree was documented along study area roadsides, as described in Section 5.2.6. This tree will not require removal based on the Preliminary Design and proposed grading limits (Map 5e). However, all of the treed natural features are considered potential habitat for SAR bats since they were not fully investigated for habitat suitability. Furthermore and for the same reason, the forest and swamp ELC communities of the study

area are considered possible SWH for Bat Maternity Colonies in accordance with provincial criteria (MNRF 2015a).

The anticipated grading encroachments into some of these features will be restricted to the road-facing edges of the communities and will not result in the fragmentation of potential bat maternity colony habitat, nor will it create any barriers to movement by bats. As the majority of the treed vegetation communities will remain intact, it is not anticipated that the proposed undertaking will negatively impact the SAR bat habitat functions provided by the wooded features. Additionally, it is expected that a roost tree density required to meet the criteria for Candidate Bat Maternity Colonies SWH designation (MNRF 2015a) can be maintained despite some edge tree removal. The minor edge habitat encroachments that are proposed are therefore not anticipated to adversely impact SAR bat habitat, nor the SWH and/or its ecological functions.

To avoid negative impacts to individual bats, tree removals must be undertaken outside of the bat active period of April 1-November 30. Adherence to this timing window is also required to ensure compliance with the SCA, pertaining to the protection of individuals of listed Endangered and Threatened species. If tree removals are required to occur within the bat active season, additional studies (e.g., bat passive acoustic monitoring) will be required, and pending the results of the additional studies, additional actions in accordance with Ontario Regulation 75/26 may be required. This may include the need to register the activities that would cause the negative impact with the Species Conservation Registry, implementation of enhanced mitigation measures, preparation and implementation of a Conservation Plan incorporating one or more Conservation Measures targeted to the species.

Provided the above recommendation is implemented, negative impacts to SAR bats or their habitat are not expected.

Potential Jefferson Salamander and Unisexual Ambystoma Salamander Species at Risk Habitat

As described in Section 6.4.2, potential SCA-protected habitat for Jefferson Salamander and Unisexual Ambystoma salamanders may extend into the study area 300m from breeding habitats that are located outside of the study area. Potential protected habitats within the study area are likely to comprise wooded features, thickets and wetlands that may provide terrestrial overwintering habitat for these species. Direct habitat impacts associated with the road improvements will be limited to narrow fringing areas of natural features along the existing

roadside areas. These habitat edges, which may be disturbed due to adjacent ROW land use, are unlikely to function as overwintering habitat. However, a more detailed assessment of potential impacts should be completed during the Detailed Design stage to determine the need for actions in accordance with Ontario Regulation 61/26, including but not limited to registration of the activity under the Species Conservation Registry, and preparation and implementation of a Conservation Plan targeted to the species.

Although movement habitat is not specifically protected under the SCA, 300m radius habitat zones for Jefferson Salamander and Unisexual Ambystoma salamanders may encompass the Regional Road 25 ROW and lands on either side, subject to more detailed MECP habitat mapping for the species if available. Maintaining and enhancing safe movement corridors for these species will be important to preserving the viability of local populations, such as to maintain access to breeding and terrestrial/overwintering habitats. See below for further discussion about recommendations for wildlife road crossing impact mitigation.

Barn Swallow Significant Wildlife Habitat

The Barn Swallow foraging habitat illustrated on Maps 5a-b was identified following a precautionary approach since the proximity of the nesting site(s) is not known. As described above, foraging habitat within 200m of the nest is considered to represent a form of the significant habitat for the species; however, this is a relatively low-sensitivity form of habitat. Barn Swallows forage over a wide array of open habitats (including developed lands) provided suitable insect prey is present. Barn Swallow foraging habitat removal associated with roadside grading activities is negligible in terms of area lost, and disturbed graded slopes will be vegetatively restored post-construction (see Section 8.0). Therefore, no impacts to Barn Swallow SWH will occur as a result of the undertaking.

Candidate Marsh Bird Breeding Significant Wildlife Habitat

The SWM4-1 community east of the ROW was identified as Candidate SWH for marsh bird breeding due to the evidence of possible breeding by Green Heron within the feature. Green Herons nest in a variety of conditions provided the site is secluded and close to or within wetland foraging habitat. Green Herons may nest singly (Davis and Kushlan 2020), so lack of observation of heron nesting colonies within the swamp community does not preclude breeding habitat use by this species. Based on the Preliminary Design, impacts to this potential Green Heron habitat are considered negligible, based on very minor grading encroachments into the

edges of the SWM4 and adjacent SWT2 features. Given this species' preference for secluded nesting sites, it is unlikely that nesting habitat would be located immediately adjacent to the road and directly impacted by the proposed road works. No negative impacts to this Candidate SWH type are therefore anticipated.

Other Special Concern and Rare Wildlife Species Habitats

Habitat for the SCC Snapping Turtle is considered to be confirmed within the study area based on the results of background information review and habitat assessments. More specifically, the study area is expected to provide a movement corridor habitat function for the species. See below for further discussion about potential for impacts to ecological connectivity and wildlife movements within the study area.

The majority of other SCC species that could not be ruled out through completion of field surveys are butterfly and odonate species that do/may have suitable habitat in the study area and have been documented within 10km of the study area. These include Sleepy Duskywing (*Erynnis brizo*), Black Dash (*Euphyes conspicua*), Purplish Copper (*Lycaena helloides*), Tawny Emperor (*Asterocampa clyton*), River Bluet (*Enallagma anna*), and Arrowhead Spiketail (*Cordulegaster obliqua*). However, the proposed road works will cause negligible, if any, direct impacts to suitable habitat for these species and will be restricted to natural feature edges. Therefore, direct impacts to these SCC habitats are not expected.

Other Wildlife Species

Most other wildlife species that occur within the study area are common and ubiquitous on the landscape, and are adapted to or have been habituated to urban environments. The planned undertaking will not negatively impact these local wildlife species or populations.

Certain other observed species are more specialized in their preferences for the woodland and swamp habitats that are present in the study area (e.g., Yellow Warbler (*Setophaga petechia*), Red-eyed Vireo (*Vireo olivaceus*), Eastern Phoebe (*Sayornis phoebe*), Spring Peeper (*Pseudacris crucifer*), Gray Treefrog (*Dryophytes versicolor*)). The road improvement works will require grading limits that extend into some of the adjacent natural features that provide habitats for these species. However, construction footprint impacts within woodland and wetland features will be negligible in terms of their overall sizes, and the road infrastructure widening itself is not anticipated to render these habitat areas unsuitable to the woodland- and wetland-

dependent species. Short-term disturbances to these species may occur during construction. See Section 7.4.1 for further discussion and appropriate mitigations associated with this.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should therefore occur outside the bird nesting season of April 1-August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. For tree removals specifically, this window should be extended to April 1-September 30 (see above). The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*.

Ecological Linkage and Wildlife Movement

Based on background information and characterization of the study area natural features, the Chudleigh Swamp complex and the wooded features at the north end of the study area, which are bisected by Regional Road 25 and convey Middle Sixteen Mile Creek, are considered locally important Wildlife Movement Corridors and Ecological Linkages. The SCC Snapping Turtle is known to use this corridor and the adjacent Chudleigh swamp habitats, as do multiple other reptile and amphibian species. The SAR Jefferson Salamander and Unisexual Ambystoma salamanders may also cross at either of these two Ecological Linkage locations, or elsewhere within the study area. The Chudleigh Swamp crossing location that falls within the area of planned road works currently contains a 6.5m wide concrete box culvert (C-2), and with a height and length of approximately 2.2m and 28m, respectively, is calculated to have an openness ratio of 0.51. Under the existing condition, this box culvert comprises suitable dimensions to convey up to medium-sized wildlife (e.g., foxes, skunks, and raccoons) including all herpetofauna species up to and including Snapping Turtles (Conservation Halton 2018). As stated in Section 7.1, replacement or alteration of the existing Culvert C-2 conveying Middle Sixteen Mile Creek is not required as part of the planned road works. Therefore, the existing culvert will continue to function to allow passage of terrestrial wildlife species that are expected to cross at that location, and will allow for continued connectivity of habitats to the east and west of the ROW.

It is nevertheless recommended that this culvert location be considered for opportunities to enhance its value for wildlife movement during the Detailed Design stage. For example, substrates within Culvert C-2 should be confirmed as suitable to facilitate target wildlife movement (e.g., turtles and salamanders). This would include use of native soils, presence of

leaf litter and small woody debris, and an avoidance of large rocks and rip rap within the structure (Conservation Halton 2018). If feasible as a retrofit, dry shelves should be provided during low flow conditions to facilitate land-based wildlife movements through Culvert C-2. Natural cover features, such as low-growing shrubs, brush piles and/or rock piles, should be placed near the culvert entrances to encourage wildlife use and to mitigate the effects of predation on wildlife using the structure.

Although the north study area wooded features are recognized as another locally important wildlife movement corridor across the Regional Road 25 ROW, the culvert that conveys Middle Sixteen Mile Creek in this location fall outside of the limits of planned road improvements. Therefore, no culvert replacement or enhancement measures for the purposes of enhancing wildlife habitat connectivity are proposed. However, it is expected that this culvert and adjacent natural features will continue to function as an ecological linkage as exists under the current condition. This culvert should be considered for wildlife movement and habitat connectivity enhancements as part of future road upgrade activities at this location.

Other wildlife road crossing mitigation measures may be considered during the Detailed Design stage, if warranted based on availability of road mortality or vehicle-wildlife collision data and/or in consultation with agency staff. This may include the installation of wildlife road crossing signage ahead of the northbound and southbound approaches to the Chudleigh Swamp crossing location, or ahead of the northbound approach to the north study area wooded riparian crossing location, or installation of directional fencing at the Chudleigh Swamp crossing location to encourage small-medium sized wildlife crossing at Culvert C-2 and to mitigate crossings along the road surface.

Detailed Design-stage consultations with the MECP should include evaluation of known mapped habitats for Jefferson Salamander and Unisexual Ambystoma salamanders in the vicinity of the study area and an assessment of their potential to cross the Regional Road 25 ROW to reach habitats on the opposite side. This will inform the need for additional survey work and/or infrastructure designs and mitigation measures to ensure that the planned road works avoid impacts to these species and their habitats. Although Jefferson Salamanders and Unisexual Ambystoma salamanders are more likely to cross the ROW where suitable habitats exist on both sides, such as at the Chudleigh Swamp crossing, the movement patterns and road crossing locations for these species are less defined by discrete riparian crossing points (e.g., Middle Sixteen Mile Creek culvert (C-2)) and may be more defined by the relative locations of

their breeding habitats, dispersal routes, and terrestrial habitat locations. Therefore, subject to MECP consultation, and if existing road mortality data for the study area is unavailable, a wildlife road mortality survey should be completed to identify herpetofauna road crossing hotspots and to assess whether Jefferson Salamander and/or Unisexual Ambystoma salamanders are crossing the ROW. The results of these surveys will identify whether existing riparian crossing points (e.g., at the Chudleigh Swamp Culvert C-2) represent optimal locations for crossing that could be enhanced for salamander movement functions, or whether an alternate location within the study area ROW experiences crossing activity and should be targeted for a dedicated ecopassage.

If the Culvert C-2 crossing location is determined or assumed to represent an important crossing location for the SAR salamanders, an assessment of the culvert's suitability for salamander passage will be required. For example, these species will likely avoid crossing through culverts that are completely filled with water. If the creation of dry shelves within the culvert at the Chudleigh Swamp is not feasible, then the installation of a separate terrestrial ecopassage under the road should be considered. Directional fencing tying in to this culvert, or to any other dedicated ecopassage that is determined to be required, will also be necessary to ensure that salamanders and other small wildlife are directed toward the passage and to lessen the potential for individuals to cross over the surface of the road. Directional fencing is to follow specifications identified for salamanders and amphibians more generally in Provincial and Conservation Halton guidelines (e.g., MNRF 2016, Conservation Halton 2018). This includes but is not limited to the use of a suitable fencing material such as hardware cloth with a mesh size of $\leq 1/4"$ or solid flat sheeting (e.g., Animex or ACO fencing), buried into the ground 10-20cm, extending 100m from the crossing on each side where possible, and at least 30cm high.

7.3.3 Impacts to Fish and Aquatic Habitats

As described in Section 6.3, Middle Sixteen Mile Creek provides sensitive coldwater habitat and direct fish habitat within the study area. Under its current state, the 6.5m span concrete box culvert C-2 facilitates flow of water and nutrients from upstream (west) to downstream (east). The existing box culvert will remain unchanged following construction. Therefore, based on the extent of the proposed work and the current condition of the watercourse, it is expected that the harmful alteration, disruption and/or destruction of fish and fish habitat can be avoided provided that mitigation measures are employed. Submission of a Request for Review (RfR) to the DFO in support of the works is not anticipated to be required, provided that the works can maintain a

footprint above the high-water mark and adhere to the DFO's Measures to Protect Fish and Fish Habitat (DFO 2025).

Standard construction mitigation measures should be employed to limit the potential impacts to fish and fish habitat, including sediment and erosion control and work-site isolation. Sediment and erosion control measures must be implemented prior to the commencement of work, and will be monitored and maintained throughout construction to prevent erosion and subsequent sedimentation downstream within Middle Sixteen Mile Creek. These are further described in Section 7.4.2.

Opportunities for enhancement of the watercourse channel and adjacent riparian habitat should be explored during the Detailed Design stage to improve their functionality and improve fish habitat. See Section 8.0 for restoration and enhancement recommendations for this section of Middle Sixteen Mile Creek.

Culvert D (see Map 1), which conveys a HDF, will require extension to accommodate the planned road widening. However, the HDF at the road crossing location is not identified as fish habitat and no DFO consultation with respect to this structure alteration is expected to be required.

7.4 Indirect Impacts

7.4.1 Construction Disturbance to Adjacent Natural Features and Habitats

Actions should be taken to avoid unnecessary or inadvertent damage or destruction of vegetation adjacent to project construction limits. Clearly defined construction limits in the form of tree protection fencing should be established to avoid unnecessary vegetation removal where tree protection measures have been recommended in the Tree Inventory Report. Silt fencing may be combined with the tree protection fencing where both of these functions are required, in accordance with applicable guidelines and standards (Halton Region 2018). Where silt fencing for ESC measures is required but not tree protection fencing, silt fencing may be used as a form of construction limit demarcation. Tree protection fencing locational details will be determined and mapped during the Detailed Design phase.

Prior to any construction activities (rough grading, vegetation and tree removal), the tree protection fencing should be installed where directed in the Tree Inventory Report to accommodate tree protection zones. Based on Regional guidelines, the tree protection fencing should be installed at minimum 0.9m outside the dripline for trees to be protected in order that

wooden support stakes can be placed at or outside the dripline (Halton Region 2018). This distance may not be feasible for many trees because the preference to retain trees will result in cases where the proposed construction activities will extend to within the tree driplines. See the Preliminary Tree Inventory Report (NRSI 2025) for further details about the recommended tree protection measures.

When construction equipment is moved from one site to another, it has the potential of inadvertently transporting seeds and other vegetative material of non-native and invasive plant species. This may therefore lead to the introduction and colonization of a site's natural features with invasive plants. Construction vehicles and machinery should therefore be properly cleaned of soils, mud and water to ensure that invasive plant species are not transported to the study area roadside construction zones where they can establish within the adjacent natural features. The following general steps should be taken:

- Vehicles and equipment should be inspected before leaving the site, or if moving from one part of the site to another where one area is known to contain a concentration of invasive plant species;
- Vehicles and equipment should be inspected after having transported soil that has the potential to contain invasive plant species;
 - o Vehicles and equipment should be inspected for dirt, plant material and seeds that may be lodged in or adhered to surfaces;
- Based on the above inspections, vehicles and equipment should be thoroughly cleaned in an area where there is no risk of spreading invasive species. The interior and exterior of vehicles and equipment should be cleaned to remove mud and debris, including along undersides and around wheels.

See the *Clean Equipment Protocol for Industry* (Halloran et al. 2016) for additional details of methods that should be followed to mitigate the spread of invasive plant species between natural areas.

Potential indirect impacts to natural features and wildlife may also arise from noise, vibrations, human presence, dust and artificial lighting associated with construction activities.

During construction activities such as vegetation clearing and grubbing, dust can potentially result in the following:

- Changes in vegetation due to increased heat absorption and decreased transpiration,
- Immediate visual impacts.

Impacts due to dust should be mitigated for by moistening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced.

Wildlife impacts resulting from dust, noise, and vibrations are expected to be temporary, minimal and localized during the road construction works. Significant effects on wildlife are not anticipated and it is expected that displaced wildlife species will return to the vicinity of the roadside features following construction. Nonetheless, construction disturbances can be mitigated by restricting the daily timing of construction activities to between 7:00hr and 19:00hr. Any artificial lighting used for construction purposes should be turned off or directed away from the adjacent natural features following the completion of daily construction activities.

7.4.2 Sedimentation and Erosion

During vegetation removal and site grading activities, areas of bare soil will be exposed along roadside areas which have the potential to erode during rainfall events and impact adjacent lands and vegetation. Reduced vegetation cover along the roadsides in combination with the presence of exposed soils during construction activities may also increase the potential for stormwater flow to down-slope areas, such as into the adjacent woodland, wetland and watercourse features if not appropriately mitigated. Increased stormwater surface flow and erosion processes may cause the deposition of sediments onto down-slope vegetation, ultimately causing vegetation die-back or impaired health. Sedimentation to the watercourses where they approach the road and at the road crossings must also be considered, and mitigated appropriately to prevent impacts fish/fish habitat and water quality degradation.

Soil compaction also has potential to occur as a result of heavy machinery in the area of construction. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This will result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent areas.

An Erosion and Sediment Control (ESC) Plan must be developed prior to any construction activities on-site. The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure, (2) retain existing vegetation, where

feasible, (3) encourage re-vegetation, (4) divert runoff away from exposed soils, (5) keep runoff velocities low, and (6) trap sediment as close to the source as possible.

The ESC Plan should include, but not be limited to, the following measures:

- Placement of silt fencing along any construction limits that are down-slope of construction zones and may receive sediment-laden runoff;
- Timing of construction activities to occur during dry periods, where possible;
- Regular inspection, maintenance/repair and where necessary, replacement of damaged silt fencing;
- Operation and storage of all materials and equipment in a manner that prevents any deleterious substance from leaving the construction zone;
- Stripping and strategic placement of topsoil stockpiles, and placement of sediment control fencing around all stockpile areas; and,
- Re-vegetation of completed areas as soon as possible after construction.

Disturbances to watercourse riparian vegetation must be avoided or minimized during construction. If riparian vegetation is disturbed or removed or disturbed, ESC measures such as silt fences, rock check flow dams and sedimentation ponds should be utilized to protect downstream receivers. These measures must be maintained during construction until the site is stabilized with seed and mulch.

7.4.3 Changes to Hydrological Regime

Surface Water Drainage and Quantity Control

No changes to the stormwater drainage patterns within the study area will occur as a result of the proposed road improvements. Currently, road runoff is drained into roadside ditches along Regional Road 25, and a roadside ditch drainage system will continue to be used as part of the new road design. All road drainage will be conveyed to roadside drainage ditches, which will incorporate dry swales (bioswales), before being discharged to existing drainage outlets. There will be no changes to the quantity of water discharged to the adjacent natural features relative to existing conditions (A. Reitmeier, HDR, pers. comm., July 2025). As such, no changes to the hydrological conditions of receiving natural features (i.e., through increases or decreases in water inputs) are expected.

Dewatering Effects on Groundwater

The Preliminary Hydrogeological Investigation Report for Regional Road 25 (Thurber Engineering 2025) assumed culvert replacements along the road would be required. As stated above, Culvert D will require extension to accommodate the planned road widening.

Excavations for those replacements were determined to require some degree of groundwater dewatering to facilitate the work, with the specific amount of dewatering to be determined during the Detailed Design stage.

The study area falls within an area of potential groundwater contribution to the Middle Sixteen Mile Creek system, including the watercourse main channel, which has been characterized as a coldwater feature that received groundwater baseflow inputs. Groundwater drawdown due to dewatering activities has the potential to cause localized effects on groundwater contributions to watercourse and wetland features whose hydrological regimes rely on these contributions. It could also affect the thermal regime of coldwater receiving watercourses. However, the hydrogeological assessment concluded that impacts to groundwater baseflow contributions are not anticipated due to the localized dewatering. It was recommended that any baseflow input reductions could be offset through inputs of dewatering discharge to the watercourse, subject to Conservation Halton authorization and provided appropriate sediment and erosion controls are implemented along with monitoring measures (Thurber Engineering 2025).

7.4.4 Water Quality Control

During Construction

During construction activities, indirect impacts may occur through faulty construction equipment. Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks. A Spill Response Plan (SRP) should be developed prior to commencement of construction if there is the potential for deleterious substance leaks during construction. This SRP should provide a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. A spill kit must also be kept on site at all times and on-site workers must be trained in the use of this kit and be fully aware of the SRP.

As stated above, as a means of mitigating potential effects on groundwater baseflow inputs to Middle Sixteen Mile Creek as a result of dewatering, dewatering discharge may be directed to the watercourse to augment baseflows. It was noted in the Preliminary Hydrogeological

Investigation Report (Thurber Engineering 2025) that groundwater quality exceeded various water quality parameters (e.g., total and dissolved cobalt, total phosphorus, total uranium). Groundwater discharge water will therefore require appropriate treatment to meet Provincial Water Quality Objectives before being released into the watercourse. Any groundwater discharge that is directed to the land surface must be discharged at least 30m away from any water bodies (Thurber Engineering 2025).

Post-Construction

As described above, the existing drainage system, utilizing roadside drainage ditches, will be retained as part of the planned road improvements. To mitigate for a minor widening of the impervious road surface area, dry swales (bioswales) will be incorporated into the roadside drainage ditch design. These systems will provide water quality treatment via filtration through an engineered filter layer (A. Reitmeier, HDR, pers. comm., July 2025). Through implementation of the system, and given the relatively minor increase in widened pavement area within the ROW, negative water quality impacts to receiving natural features as a result of the planned road upgrades are not anticipated.

Indirect water quality impacts should be considered during the Detailed Design stage regarding the potential to negatively impact the existing water quality within the study area. Use of salt during winter should be minimized, or alternatives to road salt should be used to avoid water contamination.

7.5 Induced Impacts

Induced impacts may occur where public use of the reconstructed Regional Road 25 ROW causes human-induced disturbances or stresses on adjacent natural features or existing ecological functions. For road reconstruction projects, including for the Regional Road 25 improvements, induced impacts associated with vehicular use of the road are often minimal or negligible, given the continuation of an existing transportation corridor land use and because significant increases in traffic volume are not anticipated as a result of the reconstruction itself. For example, wildlife occupying lands adjacent to the ROW are already habituated to human use of the corridor, including noise and vibration effects. However, induced impacts can occur when the redesigned ROW encourages additional pedestrian use in areas adjacent to natural features, such as through the addition of a multi-use path. For example, impacts can occur when less accessible ROWs (e.g., in terms of pedestrian or cycle use) become more accessible

and lead to increased potential for members of the public to encroach into adjacent natural features.

In the case of the Regional Road 25 study area, the proposed multi-use path only extends between the southern study area limit at 5 Sideroad to Chudleigh's Entertainment Farm. Natural feature coverage along this portion of the study area is relatively sparse and limited to lower quality and more ecologically resilient natural features. Potential negative effects caused by increased human use of the roadside areas via the multi-use path are not anticipated. No significant increases in human pedestrian or cyclist use to the north of Chudleigh's Entertainment Farm are anticipated as no multi-use path or other pedestrian infrastructure is proposed.

Impacts to wildlife road crossing and ecological linkage functions can also occur as a result of future increases in vehicular or pedestrian traffic in the redesigned ROW, regardless of whether the road redesign itself contributes to this traffic increase, or can continue to occur as an existing/ongoing impact that persists despite the ROW redesign. Measures should be taken in the ROW design to mitigate these impacts where they are identified to potentially occur, with a focus on the Middle Sixteen Mile Creek crossing at the Chudleigh Swamp complex, which represents the study area's most significant wildlife crossing location that falls within the limits of the road Preliminary Design. Specific data are not available to suggest that this crossing location currently experiences higher-than-typical road mortality for crossing wildlife. However, recommendations have been provided to enhance the quality of the Culvert C-2 and its adjacent habitat conditions to enhance its likelihood of use by crossing wildlife. Measures that are targeted to the maintenance and enhancement of SAR Jefferson Salamander and Unisexual Ambystoma salamander crossings of the ROW may also be required, subject to future MECP consultation. This may include completion of wildlife road mortality surveys to assess ROW crossing activity by these SAR salamanders and to identify wildlife crossing hotspots to inform road crossing mitigation measures (see Section 7.3.2). Additional targeted measures to mitigate wildlife road crossing hazards should be considered at the Detailed Design stage.

8.0 Ecological Restoration and Enhancement

The preferred Preliminary Design of the road improvements will require encroachment into natural feature edges along both sides of Regional Road 25. Restoration of these disturbed feature edges will therefore be necessary to mitigate the associated negative effects, such as the colonization and spread of non-native/invasive species, erosion of disturbed soils, and increases in negative edge effects within wooded natural features. The road reconstruction also affords the opportunity to enhance the natural feature edges that will be retained. It is recommended that ecological enhancements focus on significant woodland and wetland features as identified on Map 3, while restoration measures on non-significant natural features within the study area (e.g., lower quality meadow marsh at the south end of the study area; cultural plantation features) emphasize mitigative actions such as soil stabilization of disturbed/graded areas through native seed mix application.

A Restoration Planting Plan (RPP) should be prepared during the Detailed Design stage to direct the species types, locations, quantities, and other parameters associated with all restoration and enhancement zones within the study area. The RPP should address all areas of construction disturbance into adjacent natural features as well as the watercourse crossing locations within the ROW. The RPP will be prepared with regard for Conservation Halton's Guidelines for Landscaping and Rehabilitation Plans (Conservation Halton 2024b), such as with respect to site preparation and stabilization, and species selections, densities and planting configurations. At a minimum, disturbed areas along graded slopes should be stabilized with an appropriate nurse cover crop (e.g., Proso Millet (*Panicum miliaceum*), Annual Rye (*Lolium multiflorum*) or oats (*Avena sativa*)) supplemented with or followed by an application of native seed mix appropriate to the location. Seed mix selection and application rates must be in accordance with Conservation Halton guidelines (Conservation Halton 2024c). Areas of grading disturbance that extend into adjacent natural features should also be subject to additional ecological restoration treatments (e.g., native seed mix application, native woody species plantings) that are tailored to the natural feature type being restored. Restoration planting selections are to be made with reference to Conservation Halton's Native Species List (Conservation Halton 2024d), including consideration for intended planting locations and environmental tolerances (e.g., roadside conditions).

Treatment of the new woodland and swamp edges should be prescribed within the RPP and include management techniques to prevent and protect the retained natural features from further impacts. This can include activities such as selective tree removal, pruning, pre-

stressing and interplanting and should be designed by a qualified professional. Native woody vegetation plantings should also be established along the new created edges of these features, in accordance with the RPP. These plantings should be reflective of the existing species assemblage within the natural features, be suitable to the site conditions (e.g., accounting for sunlight exposure and soil conditions) and should comprise species native to Halton Region (Conservation Halton 2024d). Coordination with the owners of the adjacent properties containing the natural features will be required where any activities might extend outside of the ROW limits. Special consideration should be made for restoration species that are tolerant of harsh roadside conditions, such as species that are hardy to the effects of road salt spray and pollution.

An updated assessment of non-native/invasive species growth within the natural features to be restored (e.g., within the natural feature edge areas) should be undertaken during the Detailed Design stage. Based on these results, an Invasive Species Management Plan targeted to the non-native/invasive species at issue should be developed and incorporated into the RPP.

The feasibility of transplanting or salvaging regionally rare plants or seeds from the impacted areas should be considered and included in the RPP.

The recommendations described above will be compiled and described within an Edge Management Plan, which will guide the implementation of all required natural feature edge restoration activities including planting installations, maintenance and monitoring. The Edge Management Plan will also incorporate the Invasive Species Management Plan, any requirements for significant species relocations, disturbance inspections, and any other required edge management measures.

The planned undertaking also provides the opportunity to establish a diverse assemblage of tree plantings within the study area ROW, including species that are less susceptible to road salt and pollution toxicity effects. These ROW plantings are expected to contribute toward the compensation requirements for anticipated tree removals as recommended in the Preliminary Tree Inventory Report (NRSI 2025). ROW plantings, including the requirements for tree compensation, will be detailed in a future Landscape Planting Plan and/or RPP to be prepared during the Detailed Designs stage.

9.0 Monitoring

It is recommended that a natural environment Monitoring Plan be developed that incorporates elements of aquatic and terrestrial ecological monitoring. The Monitoring Plan should be designed within an adaptive management framework, such that monitoring data is continuously reported and reviewed by regulatory agency staff and that mitigative or remedial actions are taken when warranted in a timely manner. The components, methodologies and timing considerations of the Monitoring Plan would itself be continually under review based on these results. The Monitoring Plan should be prepared in consultation with the Region, Conservation Halton and other stakeholders as warranted (e.g., Niagara Escarpment Commission, Town of Halton Hills) during the Detailed Design stage.

Recommended monitoring measures include those summarized below, subject to agency consultation and additional natural heritage information collected during the Detailed Design stage. Recommended monitoring tasks associated with this undertaking are primarily grouped into two categories: (a) compliance monitoring associated with the effective functioning of construction mitigation measures, and (b) monitoring of terrestrial and aquatic restoration areas to ensure these features are successfully establishing as intended.

9.1 Construction-Stage Compliance Monitoring

9.1.1 Pre-Construction

Prior to any construction activity on-site, including vegetation clearing and grubbing, on-site inspections of the following should be undertaken to ensure proper installation:

- sediment and erosion control measures (e.g., silt fencing); and
- tree and natural feature protection measures, including proper installation of tree protection fencing as confirmed by a Certified Arborist/Registered Professional Forester or environmental inspector, or other construction limit fencing where tree protection fencing isn't required.

9.1.2 During Construction

Construction monitoring is the responsibility of the proponent and is to be undertaken by a designated environmental inspector or qualified delegate. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits. Construction monitoring measures are to include the following:

- Periodic monitoring of the above measures to ensure maintenance and effectiveness.

- Pruning of any limbs or roots (of trees to be retained) damaged during construction by a Certified Arborist/Registered Professional Forester.
- Visual inspection of the adjacent natural features, to ensure no unauthorized construction encroachments, vegetation damage, or other disturbances caused by construction activities.
- Fueling of machinery to be undertaken at a designated location away from the adjacent natural areas.
- Storage of machinery and material, fill, etc. in designated areas away from the adjacent natural features.

9.1.3 Vegetative and Habitat Restoration Inspections

Inspections of restoration plantings and seeded areas should be completed to ensure survival and healthy establishment. The objective of this monitoring should be to validate that the intended ecological condition (e.g., restored woodland edge) is being achieved. This is expecting that some die-back of vegetation will occur due to a variety of causes (e.g., wildlife browsing). Remedial actions should be identified for implementation if/when necessary, such as efforts to reduce competition from adjacent vegetation (e.g., cutting back overcrowding vegetation, removing non-native growth), or installing new replacement plantings. A component of this monitoring will include inspection of the restored aquatic habitat at the watercourse crossing within and immediately adjacent to the ROW. This would include detailed habitat mapping to ensure created aquatic habitat features are consistent with what was planned and installed, and may include targeted fish community surveys to determine whether the target fish community is using the features.

10.0 Summary

NRSI was retained by HDR, on behalf of Halton Region, to complete a NER to inform the Municipal Class EA and Preliminary Design for improvements to Regional Road 25, between 5 Sideroad and 10 Sideroad, in the Town of Halton Hills. The study area represents a transition between the more urbanized and developed southern end of the study area, and a predominantly rural landscape within the central and northern portions that contains a proportionally higher natural land cover. The majority of the study area natural features, including woodland and wetland features, are considered regionally and locally significant according to mapping and criteria provided by the Halton Region and Town of Halton Hills OPs. The study area also contains portions of the Greenbelt Natural Heritage System (east of the ROW), and Escarpment Natural Area and Escarpment Protection Area lands as defined in the Niagara Escarpment Plan (within the central and north ends of the study area). At the local scale, study area natural feature coverage is largely defined by the natural corridor conveying the coldwater Middle Sixteen Mile Creek. This includes the locally prominent Chudleigh Swamp, a wetland complex that is bisected by Regional Road 25 and which is identified by the OMNR as a non-PSW but which is treated as a PSW for the purposes of this study due to its potential significance. SAR Black Ash trees were documented within a portion of this swamp complex, including within 30m of the road ROW. Wooded natural features throughout the study area may also provide habitat for SAR bats. SCA-protected habitat for the SAR Jefferson Salamander and Unisexual Ambystoma salamanders may extend into the study area, including the Regional Road 25 ROW itself. Wooded features that convey a separate Middle Sixteen Mile Creek crossing of Regional Road 25 at the far north end of the study area are also recognized as comprising a locally important ecological linkage and wildlife movement corridor.

The Preliminary Design will require localized widening of the existing ROW, and grading encroachment into the edge of certain natural features on both sides of the road. These include grading encroachments into significant woodland and wetland features that represent Key Features in the Region's NHS. These areas of development encroachment are relatively minor and predominantly include roadside graded slopes that can be ecologically restored post-construction. However, road design and construction encroachments into Regionally-defined Significant Wetlands must be avoided in accordance with Regional and Town OP policies. It is further recommended that the Detailed Design consider options to eliminate or minimize development encroachment into other wooded significant natural features within the study area.

The proposed undertaking will require the removal of several roadside trees, both within and outside of the ROW, to accommodate the Preliminary Design. Tree removals must be compensated according to Regional guidelines. Where possible, these compensation tree plantings should be established within the Regional Road 25 ROW as part of natural feature edge restoration efforts and landscape planting designs. A supplementary tree inventory will be required at the Detailed Design stage to account for the full extent of the planned road improvements, and will include an updated assessment of tree removal and compensation requirements as well as details of tree retention and protection requirements.

Proposed encroachment into the White Cedar Mineral Mixed Swamp (SWM1-1) that forms the western portion of the Chudleigh Swamp complex will require consideration for potential impacts to SAR Black Ash trees and their habitat zones. This will require detailed locational surveying and a health assessment of the Black Ash trees to determine whether they fall under the protections of the SCA. Where development encroachments into wooded natural feature edges are proposed, further detailed assessments of potential for impact to SAR bats, Jefferson Salamander, Unisexual Ambystoma salamanders, and their habitats will be required at the Detailed Design stage. If negative impacts to SAR or their habitats are anticipated, actions in accordance with Ontario Regulation 75/26 may be required, including but not limited to registration of the activities under the provincial Species Conservation Registry and preparation of Conservation Plans. Negative impacts to other forms of confirmed or possible/candidate SWH identified in this study area are not anticipated.

The existing box culvert C-2 conveying Middle Sixteen Mile Creek within the study area will not require extension or replacement. Therefore, negative effects on fish or aquatic habitats are not anticipated provided standard construction mitigation measures are implemented and work is maintained outside of the high-water mark. A DFO Request for Review submission is not expected to be required provided these measures are implemented.

Opportunities to enhance the functionality of the existing Culvert C-2 conveying Sixteen Mile Creek at the Chudleigh Swamp ecological linkage location for the purposes of wildlife passage and road mortality mitigation should be explored during the Detailed Design stage. A focus of this investigation should be on the effective passage of SAR Jefferson Salamander and Unisexual Ambystoma salamanders, SCC Snapping Turtles and other herpetofauna species. This should include determination of whether the existing culvert can accommodate a dry shelf and whether roadside wildlife directional fencing tied into the culvert openings is warranted.

Road mortality mitigation measures for Jefferson Salamander and Unisexual Ambystoma salamanders are to be further considered during the Detailed Design stage, including the need for supplemental surveys to guide wildlife ecopassage design requirements. Other wildlife road mortality mitigation measures (e.g., roadside signage) are to be considered for the study area as a whole during the Detailed Design stage.

Various other recommendations were provided to effectively mitigate indirect and induced impacts associated with the planned road improvements. Recommendations have also been provided for the restoration and enhancement of the adjacent natural features and the watercourse channel within the ROW, and to monitor construction-stage mitigation measures and post-construction ecological enhancements.

Provided the above measures are implemented, and subject to future Detailed Design-stage requirements, it is expected that all applicable Regional, municipal, and provincial plan policies regarding the need to avoid or minimize infrastructure reconstruction disturbances to the natural heritage features and ecological functions have been appropriately satisfied.

10.1 Recommendations

The following recommendations should be carried forward for application during the Detailed Design stage, or for inclusion in the Detailed Design plans for Regional Road 25. See the Preliminary Tree Inventory Report (NRSI 2025) for additional recommendations pertaining to tree protection and compensation.

Table 5. Summary of Natural Environment Report recommendations.

Number	Recommendation
1.	Areas of identified Preliminary Design encroachment into Significant Wetland features must be removed during the Detailed Design stage in accordance with Regional and Town Official Plan requirements prohibiting development or site alteration within Significant Wetlands.
2.	Efforts should be made during the Detailed Design stage to avoid or minimize encroachments into other natural features, with a focus on identified Significant Woodland features.
3.	An updated and detailed inventory and health assessment of Black Ash trees within the study area's Chudleigh Swamp wetland communities, west and east of the ROW, should be completed by a qualified biologist to update mapping of Black Ash tree locations and to determine whether the trees qualify for protection under the <i>Species Conservation Act</i> .
4.	Measures should be taken to avoid or mitigate impacts to regionally significant vegetation species along roadside areas, such as through transplantation of individuals or seed collection and dispersal if necessary.
5.	A supplementary tree inventory will be required to update the preliminary tree inventory data collected for the EA, and an updated Tree Protection Plan should be prepared based on the Detailed Design.
6.	Landowner permissions will be required to accommodate removal of an estimated 33 boundary or privately owned inventoried trees.
7.	An estimated total of 855 compensation tree plantings will be required and should be planted within the Regional Road 25 ROW as part of natural feature edge restoration and landscape plan designs, to the extent feasible.
8.	All tree removals should be completed outside of the period April 1-November 30 to avoid contravention of the <i>Species Conservation Act</i> with respect to SAR bat impacts. All other non-tree vegetation removal should be completed outside of the period April 1-August 31 to avoid contravention of the <i>Migratory Birds Convention Act</i> .
9.	A further detailed assessment of the potential for impact to SAR bats, Jefferson Salamander, Unisexual Ambystoma salamanders, and their associated habitats should be completed based on the Detailed Design where road infrastructure and construction encroachment into adjacent wooded natural features is proposed.
10.	Culvert C-2 conveying Middle Sixteen Mile Creek adjacent to the Chudleigh Swamp should be considered for enhancements as a wildlife crossing structure, such as through determination of whether it contains appropriate substrates to allow wildlife movement, the feasibility of installing dry shelves if necessary, and the establishment of wildlife cover habitat objects at the culvert openings. The need for other wildlife crossing mitigation measures (e.g., signage, directional fencing) should be considered during the Detailed design stage.
11.	The MECP should be consulted to confirm whether there is potential for road crossings of SAR Jefferson Salamander or Unisexual Ambystoma salamanders within the study area, to confirm the need for any supplementary field surveys, and to confirm appropriate strategies to maintain and enhance habitat connectivity across the ROW while mitigating road mortality impacts.
12.	Construction works should maintain a footprint above the Middle Sixteen Mile Creek high-water mark and adhere to the DFO's Measures to Protect Fish and Fish Habitat. If this cannot be achieved, a DFO Request for Review may be required.
13.	Standard construction mitigation measures at the watercourse crossing must be implemented, including but not limited to appropriate sediment and erosion control methods, work site isolation, completing work in the dry where possible, and associated monitoring of the efficacy of these measures.

14.	Tree protection fencing must be installed and regularly inspected for structural integrity and functionality in accordance with the Tree Protection Plan.
15.	The Clean Equipment Protocol (Halloran et al. 2016) should be implemented to mitigate the potential spread of invasive plant species from one site to another during construction.
16.	Standard dust control measures must be implemented during construction, such as moistening areas of bare, dry soil as needed.
17.	Daily construction activities should be restricted to the period 7:00hr and 19:00hr.
18.	Any artificial lighting for construction purposes should be turned off or directed away from the adjacent natural features following the completion of daily construction activities.
19.	Sediment and erosion control measures must be installed and regularly inspected in accordance with an Erosion and Sediment Control Plan.
20.	If riparian vegetation is disturbed, ESC measures should be implemented including silt fencing, rock check flow dams and/or sedimentation ponds to protect downstream areas.
21.	Grassed bioswales are to be integrated into the plan for reinstatement of roadside drainage ditches to attenuate road runoff flows and improve runoff water quality via filtration prior to discharge into adjacent natural features.
22.	A Spill Response Plan should be prepared and should be employed as necessary in the event of any contaminant spills during construction activities
23.	Groundwater dewatering discharge will require appropriate treatment to meet Provincial Water Quality Objectives before being released into the watercourse. Any groundwater discharge that is directed to the land surface must be discharged at least 30m away from any water bodies
24.	Recommendations for measures to minimize winter road salt application and release into the adjacent natural features should be considered during the Detailed Design stage.
25.	A Restoration Planting Plan should be prepared to identify and map details of planned vegetation enhancement and restoration plantings along natural feature edges.
26.	The Restoration Planting Plan should be completed as part of an Edge Management Plan that will focus recommended measures to restore and improve the condition and resiliency natural feature edges that have been disturbed through road construction activities.
27.	As part of the Edge Management Plan, an updated assessment of invasive species cover along natural feature edges should be completed, and an Invasive Species Management Plan should be implemented post-construction.
28.	As a component of the Restoration Planting Plan, details of riparian corridor restoration and enhancement should be identified, including plantings to improve bank stability and improve shading of the watercourse.
29.	A natural environment Monitoring Plan should be developed that incorporates pre-construction and construction-stage inspections of tree protection and erosion and sedimentation control measures, and inspections of restoration planting and riparian habitat enhancement success.
30.	An Environmental Implementation Report should be prepared during the Detailed Design stage, which will summarize the results of any necessary supplemental field surveys, incorporate an updated impact assessment based on the refined Detailed Design, and update associated mitigation recommendations and necessary actions following agency consultations.

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