

Final Environmental Conditions Report

Highway 400 to Highway 404 Link (Bradford Bypass)

Ontario Ministry of Transportation

60636190

October 2022

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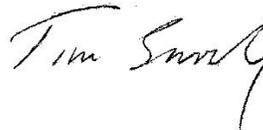


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This Final Environmental Conditions Report is available through the Project Website www.bradfordbypass.ca in accordance with Ontario Regulation 697/21, Section 19.

Revision History

Rev #	Revision Date	Revised By:	Revision Description
1	August 4, 2022	AECOM	Draft Environmental Conditions Report
2	August 12, 2022	AECOM	Draft Environmental Conditions Report
3	October 27, 2022	AECOM	Final Environmental Conditions Report

Distribution List

# Hard Copies	PDF Required	Association / Company Name
-	✓	Ontario Ministry of Transportation
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Executive Summary

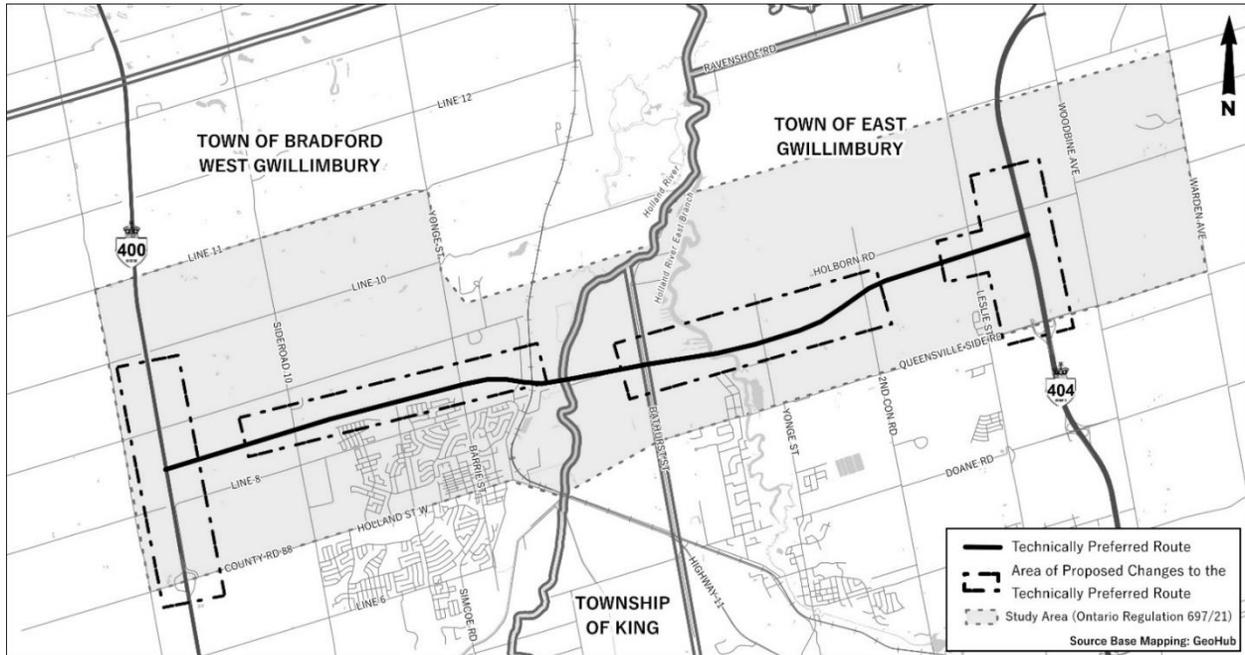
The Ontario Ministry of Transportation (the Ministry) has retained AECOM Canada Ltd. (AECOM) to undertake a Preliminary Design and project-specific assessment of environmental impacts for the proposed Highway 400 to Highway 404 Link (Bradford Bypass). The Bradford Bypass (the project) is being assessed in accordance with Ontario Regulation 697/21 (the Regulation) (October 7, 2021). The Ministry previously completed a route planning study for the Bradford Bypass that received subsequent approval in 2002.

The Bradford Bypass is a proposed 16.2 kilometre controlled access freeway, that will extend from Highway 400 between 8th Line and 9th Line in Bradford West Gwillimbury, will cross a small portion of King Township, and will connect to Highway 404 between Queensville Sideroad and Holborn Road in East Gwillimbury. There are proposed full and partial interchanges, as well as grade separated crossings at intersecting municipal roads and watercourses, including the Holland River and Holland River East Branch. This project also includes the Preliminary Design for the replacement of the 9th Line structure on Highway 400, which will accommodate the proposed future ramps north of the Bradford Bypass corridor.

In accordance with the Regulation, an Environmental Conditions Report is required to be prepared. The purpose of this Environmental Conditions Report (this Report) is to provide a description of the existing environmental conditions related to the project and document the changes to the previously identified Technically Preferred Route (approved in 2002) as a result of changes to the environmental conditions, in accordance with the Regulation. At the completion of this Preliminary Design study, an Environmental Impact Assessment Report will be prepared to document the overall evaluation of alternatives, refinements of the Technically Preferred Route (Recommended Plan), environmental impacts, proposed mitigation measures, and consultation activities.

The Study Area for the project is within Simcoe County (Town of Bradford West Gwillimbury) and Regional Municipality of York (Township of King and Town of East Gwillimbury). This Study Area was identified for assessment of potential impacts of the project in the 2002 Approved Environmental Assessment. The Study Area and 2002 Technically Preferred Route are shown in grey on **Figure ES-1** below.

ES-1: Bradford Bypass Study Area



Study Process

The Preliminary Design and project-specific assessment of environmental impacts for the Bradford Bypass is being undertaken in accordance with the Regulation. The Regulation provides a defined framework for the proponent to follow the assessment and decision-making surrounding the potential environmental impacts of the project.

This Report has been prepared in accordance with **Section 16(2)**, **Section 16(3)** and **Section 19(1)** of the Regulation and contains the information outlined in **Table ES-1**.

Table ES-1: Report Contents in Accordance with Ontario Regulation 697/21: Bradford Bypass Project

Regulation Section	Requirement	Report Section
Section 16(2)(1)	A map showing the Study Area and the technically preferred route.	Section 1
Section 16(2)(2)	An update to the description of the environmental conditions in the Bradford Bypass Environmental Assessment, including any updates from the early works report, if any.	Section 2
Section 16(2)(3)	A description of all studies undertaken in relation to updating the environmental conditions in the study area, including, <ul style="list-style-type: none"> i. a summary of all data collected or reviewed, and ii. a summary of all results and conclusions. 	Section 2
Section 16(2)(4)	An identification of, <ul style="list-style-type: none"> i. any changes to the environmental conditions identified in paragraph 2, 	Section 2
Section 16(2)(4)	<ul style="list-style-type: none"> ii. any changes to the technically preferred route as a result of the changes to the environmental conditions identified in paragraph 2, and iii. at least two alternatives for any changes identified to the technically preferred route identified in subparagraph ii. 	Section 5
Section 16(2)(5)	A description of the changes identified in accordance with paragraph 4, if any, to the technically preferred route and the reasons for the change.	Section 5
Section 16(2)(6)	If there are proposed changes to the technically preferred route identified in accordance with paragraph 4, the contents required by clause (3) (a).	Section 5
Section 16(2)(7)	A description of the proposed updated technically preferred route, subject to the results of the process required by clause (3) (b), if any.	Section 6
Section 16(2)(8)	A consultation record for preparation of the Draft Environmental Conditions report, including, <ul style="list-style-type: none"> i. a description of the consultations carried out with Indigenous communities, in accordance with the Indigenous Consultation Plan prepared under section 15, and with other interested persons, ii. a list of the Indigenous communities and interested persons who participated in the consultations, 	Section 4

Regulation Section	Requirement	Report Section
	<ul style="list-style-type: none"> iii. summaries of the comments submitted by Indigenous communities and interested persons, iv. a summary of discussions that the proponent had with Indigenous communities, and copies of all written comments submitted by Indigenous communities, v. a description of what the proponent did to respond to concerns expressed by Indigenous communities and interested persons, and vi. any commitments made by the proponent to Indigenous communities and interested persons in respect of the Bradford Bypass Project. 	
Section 16(3)	<p>If the proponent determines that changes to the technically preferred route are necessary based on the evaluation in paragraph 4 of subsection (2),</p> <ul style="list-style-type: none"> (a) for any proposed changes within the study area, the Draft Environmental Conditions report must contain, <ul style="list-style-type: none"> (i) the proponent’s assessment and evaluation of any impacts that the change might have on the environment, and (ii) a description of any measures proposed by the proponent for mitigating any negative impacts that the change might have on the environment; and 	Section 6
Section 16(3)	<ul style="list-style-type: none"> (b) for any proposed changes outside of the study area, the proponent must, <ul style="list-style-type: none"> (i) evaluate those changes in accordance with the Class Environmental Assessment, and (ii) incorporate the results of the Class Environmental Assessment process into the Draft Environmental Conditions report or the draft environmental impact assessment report to reflect any changes to the technically preferred route. 	Section 6
Section 19(1)	<p>Following the consultation described in section 18, the proponent shall,</p> <ul style="list-style-type: none"> (a) update the draft environmental conditions report, including by adding, <ul style="list-style-type: none"> (i) a description of any concerns raised by Indigenous communities and interested persons, (ii) a description of what, if anything, the proponent did or will do in respect of the concerns raised, and (iii) a description of any changes to the environmental conditions report as a result of addressing concerns raised during consultation under section 18; and (b) publish a final environmental conditions report on the Project website. 	Section 7

Existing Environmental Conditions

Section 4 describes the natural, socio-economic and cultural aspects of the existing environment as well as transportation and engineering aspects within the Bradford Bypass Study Area. Information on the following environmental components is provided in the sections below.

■ Natural Environment:

- Terrestrial ecosystems (**Section 2.1.1**)
- Fish and fish habitat (**Section 2.1.2**)
- Stormwater and drainage (**Section 2.1.3**)
- Groundwater and hydrogeology (**Section 2.1.4**)
- Fluvial geomorphology (**Section 2.1.5**).

■ Social and Economic Environment:

- Land use and property (**Section 2.2.1**)
- Agriculture (**Section 2.2.2**)
- Noise and vibration (**Section 2.2.3**)
- Air quality (**Section 2.2.4**)
- Contamination, waste and excess materials management (**Section 2.2.5**).

■ Cultural Environment:

- Archaeology (**Section 2.3.1**)
- Built heritage and cultural heritage landscapes (**Section 2.3.2**).

■ Engineering and Transportation

- Traffic and transportation (**Section 2.4.1**)
- Geotechnical studies (**Section 2.4.2**)
- Utilities (**Section 2.4.3**).

Changes to the Technically Preferred Route

Section 5.1 of this Environmental Conditions Report focuses on the proposed changes to the Technical Preferred Route that have been triggered by the changes to the environmental conditions in the Study Area since the 2002 Approved Environmental Assessment. **Table 5-2** outlines the proposed refinements to the Technically Preferred Route and identifies if the refinements were triggered by environmental conditions changes or design requirements (e.g., changes to design or safety standards). Of the 18 refinements noted in **Table 5-2**, only two are considered changes to environmental conditions. The other 16 refinements are design-related changes, and although design-related changes can result in environmental changes, the environmental conditions are

not the source of the trigger. Therefore, only direct changes in environmental conditions are outlined in **Section 5.2** of this report. Additional details on all refinements will be discussed in the Environmental Impact Assessment Report, under separate cover.

Environmental Issues and Commitments

Section 6.2 of this Environmental Conditions Report identifies the key environmental issues, preliminary potential impacts for proposed changes to the Technically Preferred Route from the 2002 Approved Environmental Assessment Study Area and outlines the recommended preliminary mitigation measures to be implemented as project planning progresses. Where appropriate, preliminary monitoring has been identified and will form commitments during further design and construction phases of the project, to verify the effectiveness of mitigation measures developed and implemented for the project. Commitments will include but not limited to a preliminary list of the permits, licences, authorizations, approvals, and legislative requirements.

Consultation Process

The consultation process followed for this project is described in **Section 4** of this Report and a Record of Consultation is included in **Appendix B**. The consultation process follows consultation and engagement strategies outlined in the Bradford Bypass Consultation Plan (AECOM, 2021) and the Indigenous Consultation Plan (AECOM, 2022).

The Project Team has followed the requirements outlined in the Regulation and implemented the following engagement and consultation activities to reach Indigenous communities, public stakeholders, municipalities, and government agencies and provide them the opportunity to submit comments and feedback for consideration by the Project Team:

- Project Website (www.bradfordbypass.ca)
- Project Telephone Line (1-877-247-6036)
- Project Contact List
- Emails via the Project Team email address (ProjectTeam@bradfordbypass.ca)
- Mailings/notifications (via physical mail or email)
- Newspaper advertisements
- Distributions of brochure notifications (copy of the Ontario Government Notice) through Canada Post Neighbourhood Mail to residences and businesses within 500 metres of the entire Bradford Bypass Study Area (approximately 13,500 notices at the time of Study Commencement in September 2020)

- Public Information Centre #1 (held virtually in April and May 2021 as a result of government restrictions)
- Preliminary Design Interchange Consultation Event (held virtually between April and May 2022)
- Outreach regarding engagement and consultation with Indigenous communities, further outlined in **Section 4**
- Meetings and correspondence with municipalities
- Correspondence with technical stakeholders, local community groups and property owners.

The Notice of Publication of the Draft Environmental Conditions Report was issued to the public on July 28, 2022, through a variety of media (Project Website, registered mail, newspapers, and mail drop via Canada Post to nearby addresses). There was a delay in posting of the Draft Environmental Conditions Report that was originally scheduled for August 4, 2022. The Draft Environmental Conditions Report was available for public review on the Project Website from **August 12, 2022**, to **September 16, 2022**, to obtain further feedback on the project. Feedback received during the Draft Environmental Conditions Report public review period has been considered and incorporated into this Final Environmental Conditions Report. A Notice of Publication of the Final Environmental Conditions Report was issued to the public on **October 27, 2022**, through the same media as the Notice of Draft Environmental Conditions Report (Project Website, registered mail, newspapers and mail drop via Canada Post to nearby addresses). The Final Environmental Conditions Report is available on the Project Website.

Refer to **Table 7-1** for a summary of all comments received during the Draft Environmental Conditions Report public review period and associated changes made to the Final Environmental Conditions Report.

Next Steps

The following key project milestones are anticipated following the completion of the Environmental Conditions Report:

- Public Information Centre #2: Anticipated Fall 2022
- Draft Environmental Impact Assessment Report: Anticipated 2023
- Final Environmental Impact Assessment Report: Anticipated 2023
- Preliminary Design for the Bradford Bypass Project Anticipated Completion: 2023.

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Appendix B. Consultation

B1: Notices

B2: Meeting Materials

B3: Record of Consultation

1. Overview of Undertaking

1.1 Project Overview

The Ontario Ministry of Transportation (the Ministry) has retained AECOM Canada Ltd. (AECOM) to undertake a Preliminary Design and project-specific assessment of environmental impacts for the proposed Highway 400 – Highway 404 Link (Bradford Bypass). The Bradford Bypass (the project) is being assessed in accordance with Ontario Regulation 697/21 (the Regulation) (October 7, 2021).

The Bradford Bypass is part of Ontario's plan to expand highways and public transit across the Greater Golden Horseshoe to fight congestion, create jobs and prepare for the massive population growth expected in the next 30 years. Simcoe County's population is expected to increase to 416,000 by 2031, with the Regional Municipality of York growing to 1.79 million by 2041. The Bradford Bypass has been proposed as a response to this dramatic growth in population and travel demand in the area and the forecasted increase in congestion on key roadways linking Highway 400 to Highway 404.

The project is a new 16.2 kilometre controlled access freeway. The proposed highway will extend from Highway 400 between 8th Line and 9th Line in Bradford West Gwillimbury, will cross a small portion of King Township, and will connect to Highway 404 between Queensville Sideroad and Holborn Road in East Gwillimbury. There are proposed full and partial interchanges, as well as grade separated crossings at intersecting municipal roads and watercourses, including the Holland River and Holland River East Branch. This project also includes the Preliminary Design for the replacement of the 9th Line structure on Highway 400, which will accommodate the proposed future ramps north of the Bradford Bypass corridor.

The purpose of this Environmental Conditions Report (this Report) is to provide an update to the description of environmental conditions from the 2002 Approved Environmental Assessment, describe the associated studies undertaken within the Study Area, and identify the proposed changes to the Technically Preferred Route as a result of changes to the environmental conditions, in accordance with the Regulation. This Environmental Conditions Report provides a preliminary assessment of potential environmental impacts associated with the proposed changes and includes recommended measures to mitigate potential effects.

Upon completion of the Draft Environmental Conditions Report engagement and consultation period, the Final Environmental Conditions Report has been prepared and filed to the Project Website. As part of the Preliminary Design, the assessment and

evaluation of environmental impacts will be completed. Once the Updated Technically Preferred Route is selected through the Preliminary Design evaluations, the potential environmental impacts will be documented in an Environmental Impact Assessment Report along with proposed measures to mitigate negative impacts to the environment, and measures to monitor the effectiveness of the mitigation measures. The Draft Environmental Impact Assessment Report will be prepared under separate cover in accordance with the Regulation and will be made available for a public review period.

1.2 Project Background

The Ministry previously completed a Route Planning study for the Bradford Bypass in 1997, and a subsequent Environmental Assessment and Recommended Plan were approved in 2002, as described in **Section 1.2.1** and **Section 1.2.2** below.

1.2.1 Route Planning and Environmental Assessment Study (1992 – 1997)

The Environmental Assessment Report (McCormick Rankin Corporation, 1997) was prepared to document the environmental assessment process for the route selection, right-of-way designation and future commitments for the Highway 400-Highway 404 Link. The original Route Planning study addressed several transportation problems which were identified in the northern part of York Region and southeastern part of Simcoe County. The identified problems were related to the Ministry's mandate to provide for the safe, efficient movement of people and goods between regions and urban areas.

The analysis of municipal development plans indicated that there will be a continuation of dramatic growth in travel demand, which has been characteristic of Simcoe County and York Region for many years. This growth continues to contribute to congestion on key roadways linking Highway 400 to the extension of Highway 404. At the time of the Route Planning study and Environmental Assessment, the approved plans to upgrade regional roads were only expected to accommodate a fraction of this travel demand. Alternative transportation solutions to regional road widening alone were therefore warranted. As part of the Route Planning study and Environmental Assessment, key problem areas included: traffic, road discontinuities, future demand growth implications, and lack of long-term plan. The original study considered need for relief of congestion and protection of property for the future transportation right-of-way.

The Route Planning study identified a Technically Preferred Route for the project, described as a 16.2 kilometre rural 4-lane controlled access freeway connecting Highway 400 in Bradford West Gwillimbury to the proposed extension of Highway 404 in East Gwillimbury.

A Notice of Approval to proceed with the undertaking was issued by the Minister of Environment and Energy (currently the Ministry of the Environment, Conservation and Parks) on August 28, 2002. Fifteen conditions were issued as part of the approvals process. The 2002 Approved Environmental Assessment Report and many of the approval conditions have been incorporated into the process set out in the Regulation. The 2002 Approved Environmental Assessment Study Area and Technically Preferred Route are shown on **Figure 1-1**.

As part of this project, a detailed review and update to the environmental conditions described in the 2002 Approved Environmental Assessment is being undertaken. Descriptions of environmental conditions are provided in **Section 1.5.4**.

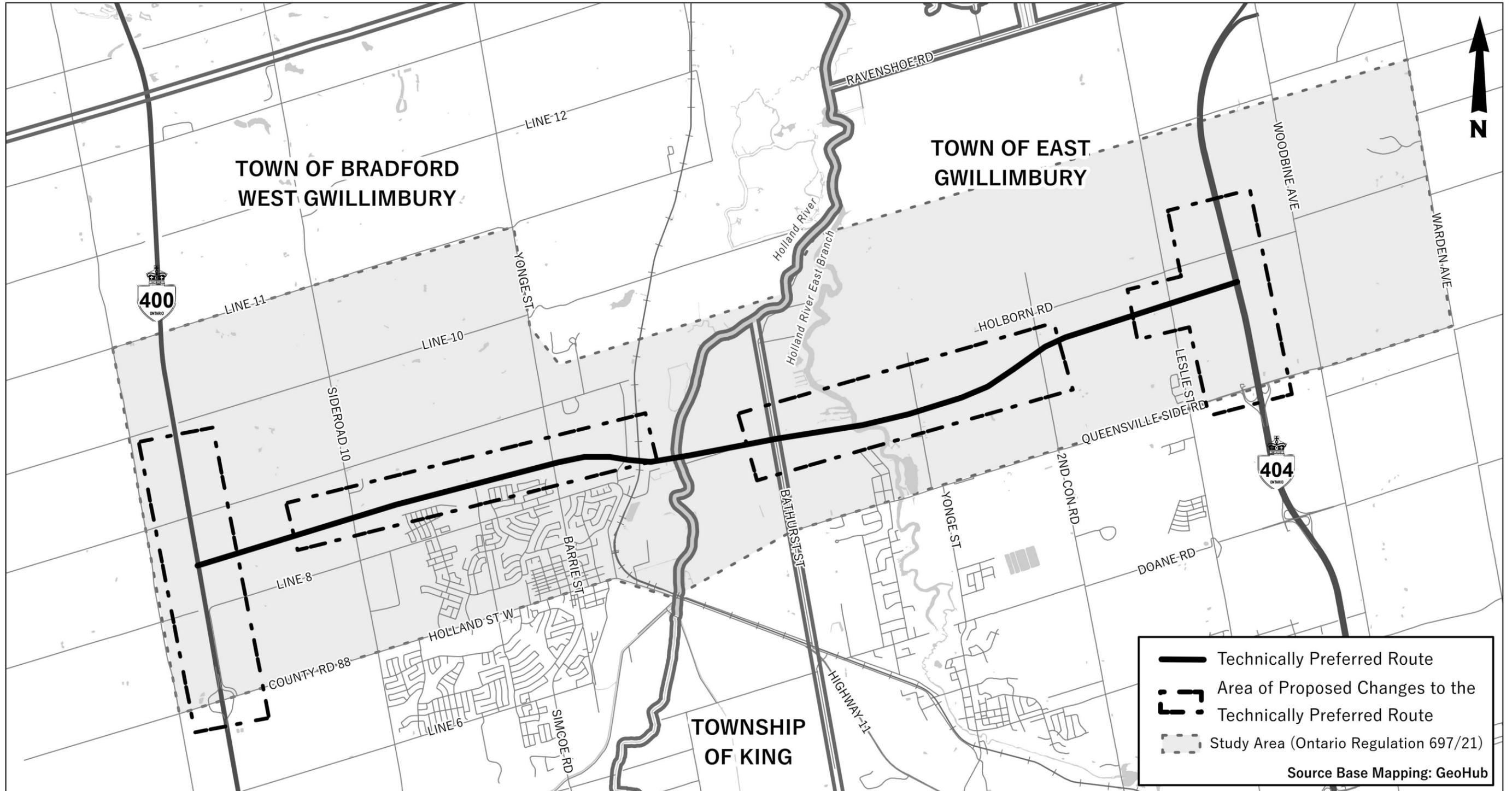
1.2.2 Preliminary Design Preparatory Work for Design Updates, Environmental Technical Updates and Permission to Enter (2019-2020)

In August 2019, the Ministry approved the re-initiation of design activities for the Bradford Bypass. In advance of the current Preliminary Design assignment, AECOM completed preparatory work relating to updating environmental existing conditions, engineering design and initiated the process for securing Permission to Enter for field investigations.

The engineering design update involved a review of the highway geometrics for the project that were developed as part of the Route Planning study. Through the engineering update, alternatives to modify the design in accordance with current ministry safety and engineering design standards were identified and will be further evaluated in the selection of preferred alternatives.

The environmental technical update consisted of background data collection through secondary source desktop studies to update the technical information related to specific environmental disciplines based on the 2002 Approved Environmental Assessment Study Area, plus a buffer area beyond the Ministry right-of-way limits. The updated disciplines included: Archaeology, Built Heritage, Fisheries, Groundwater, Land Use Factors, Terrestrial Ecosystems, and Waste and Contamination. Based on the findings of the update work, an update to the environmental commitments to future work was noted and is being carried forward throughout the Preliminary Design phase.

Figure 1-1: Bradford Bypass Study Area



1.3 Study Area

The 2002 Approved Environmental Assessment Study Area (hereinafter referred to as the Study Area) for the project is located within the Simcoe County (Town of Bradford West Gwillimbury) and Regional Municipality of York (Township of King and Town of East Gwillimbury) as described and set out in the Regulation and the 2002 Approved Environmental Assessment. The Study Area was identified for assessment of potential impacts of the project in the 2002 Approved Environmental Assessment and is shown in grey on **Figure 1-1**.

As part of the update to the existing environment conditions for the project, discipline-specific study areas were developed for the environmental disciplines described in **Section 2**, to account for potential impacts from the project. The study areas for each discipline are defined in **Table 1-1**. Methodology used to define the local environmental conditions for each discipline is described in **Section 2.1** to **Section 2.3**.

1.4 Study Process

1.4.1 Ontario Regulation 697/21: Bradford Bypass Project

The project is being assessed in accordance with Ontario Regulation 697/21. The Regulation provides a defined framework for the proponent (the Ministry) to conduct the assessment and decision-making surrounding the potential natural environment, social and economic environment, cultural environment, and engineering impacts of the Bradford Bypass.

The Regulation includes provisions for engagement and consultation with the public, agencies, and Indigenous communities in addition to environmental conditions, early works, targeted specialist reports and plans for noise, Stage 3 archaeological assessment, stormwater management plan, groundwater protection and well monitoring plan, and environmental impact assessment reporting requirements.

The Ministry is required to complete all regulatory requirements set forth in the Regulation, such as carrying out engagement and consultation, conducting environmental studies and obtaining permits and approvals for the project. The introduction of the Regulation does not change the purpose or requirement for completing environmental studies for the project from the Environmental Assessment process.

Table 1-1: Study Area Definition by Discipline

Discipline	Study Area Definition Approach
Terrestrial Ecosystems	The Terrestrial Ecosystems Study Area includes the Bradford Bypass 100-metre right-of-way and within 120 metres of the Highway 400 and 9 th Line structural replacement. Additional desktop analysis was completed for areas within 120 metres of the general Bradford Bypass Study Area.
Fish and Fish Habitat	The Fish and Fish Habitat Study Area includes the Bradford Bypass right-of-way and a 200 metre buffer downstream and 50 metre buffer upstream, where Permission to Enter was granted. This buffer was developed to assess water features detected through background review and field investigations.
Stormwater and Drainage	The Stormwater and Drainage Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer.
Groundwater and Hydrogeology	The Groundwater and Hydrogeology Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer to assess physical, geological, and hydrogeological settings.
Fluvial Geomorphology	The Fluvial Geomorphology Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer. This buffer was developed to include the reaches upstream and downstream of the proposed crossings.
Land Use and Property	The Land Use and Property Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer. This buffer was developed to identify all lands that are anticipated to be impacted by the project.
Agriculture	The Agriculture Study Area includes the Bradford Bypass right-of-way a 500-metre buffer. This buffer was developed from a variety of data sources, land use official plans and policies, zoning by-laws and other guidelines to characterize the agricultural community and the assessment of impacts both on and in the immediate vicinity of the Bradford Bypass.
Noise and Vibration	The Noise and Vibration Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer to accommodate for Noise Sensitive Areas that may be most impacted by the project.

Discipline	Study Area Definition Approach
Air Quality	The Air Quality Study Area includes the Bradford Bypass right-of-way and a 500-metre buffer. This buffer was developed in accordance with the Ministry of Transportation’s Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions for Provincial Transportation Projects (2020), and to accommodate for the distance within which air quality contaminants from roadways are most likely to be dispersed.
Contamination, Waste and Excess Materials	The Contamination, Waste and Excess Materials Study Area consists of the Bradford Bypass right-of-way and a 500-metre buffer. This buffer was developed to identify and review properties/areas with actual or potential site contamination that may impact future phases of the project.
Archaeology	The Stage 1 Archaeological Assessment Study Area consists of the Bradford Bypass right-of-way plus a 500-metre buffer.
Built Heritage Resources and Cultural Heritage Landscapes	The Built Heritage Resources and Cultural Heritage Landscapes Study Area includes a Bradford Bypass right-of-way and a 500-metre buffer. This accounts for all lands potentially affected through either displacement and/or disruption by the proposed highway design and construction. The Built Heritage Resources and Cultural Heritage Landscapes Study Area may be refined as the study progresses.

As part of the Preliminary Design, the Ministry is undertaking an independent Value Engineering Study. The Value Engineering Study is an important part of the overall study process, and can result in refinements or changes to alternatives, that best achieve a balance between cost and benefit to the public. The Value Engineering Study reviews various facets including alignments, freeway interchanges, sideroad interchanges and configurations, and spans over waterways. At the time of preparation of this Environmental Conditions Report, the Value Engineering Study is on-going, and thus the opportunity exists for the incorporation of additional refinements to the alternatives presented and updates to the evaluation. Should additional alternatives or refinements be incorporated after the completion of this Environmental Conditions Report, the alternatives or refinements will be presented at Public Information Centre #2 and fully documented in the Environmental Impact Assessment Report, under separate cover.

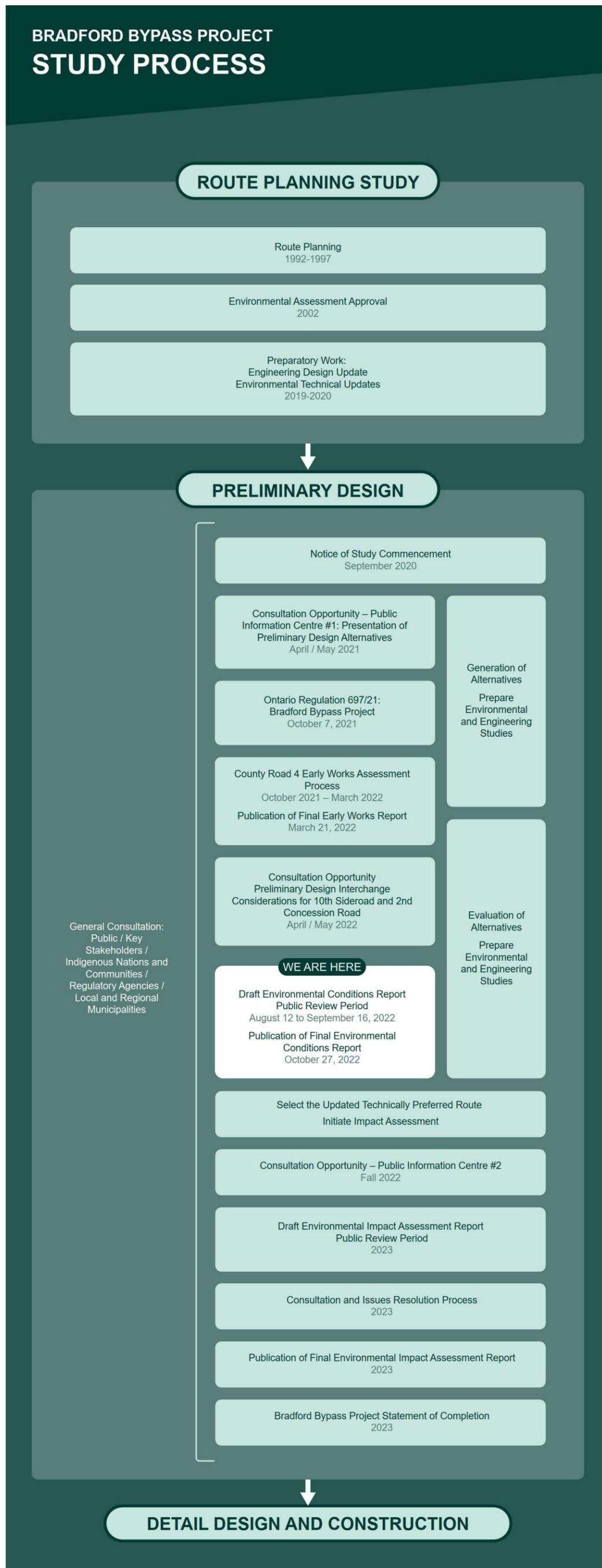
The study process is shown in **Figure 1-2**. Please note that the project timeline noted below is subject to change and will be updated throughout the project, as required.

1.4.2 Environmental Conditions Report

1.4.2.1 Draft Environmental Conditions Report

The Draft Environmental Conditions Report was prepared to satisfy the requirements of Section 16 of the Regulation. The Draft Environmental Conditions Report built upon the environmental technical update and summarized the environmental conditions within the project Study Area. The environmental conditions were characterized through a combination of desktop reviews and field studies by practitioners using industry standard techniques and provincial standards, protocols, and guidelines, where appropriate. The Draft Environmental Conditions Report also provided a preliminary assessment and evaluation of potential impacts that the project might have on the environment and provides details on how these impacts were captured in the Early Works Report or will be captured in the Environmental Impact Assessment Report, under separate cover. A description of preliminary mitigation measures and monitoring activities was outlined in the Draft Environmental Conditions Report and will be carried forward and updated as part of the Environmental Impact Assessment Report (**Section 6.2**). A list of any municipal, provincial, federal, or other permits and approvals, applicable legislative frameworks that may be required for the project is summarized in **Section 1.5.4**. This list will be updated as the project progresses, or where there is a change in legislative requirements.

Figure 1-2: Bradford Bypass Project Study Process



A summary of engagement and consultation carried out with Indigenous communities, agencies and key stakeholders is provided in **Section 4**, along with commitments to further consultation throughout the completion of design and into construction.

The Draft Environmental Conditions Report was available on the Project Website from August 12, 2022 until September 16, 2022. Indigenous communities, interested persons and key stakeholders were encouraged to visit the Project Website (www.BradfordBypass.ca/consultation/) or contact the Project Team by phone or email as listed below to participate in the consultation on the Draft Environmental Conditions Report (Ontario Regulation 697/21 Section 18).

- **Website:** www.BradfordBypass.ca/consultation/
- **Email:** ProjectTeam@BradfordBypass.ca
- **Toll-Free Number:** 1-877-247-6036

Anyone with accessibility requirements who would like to participate in this project was encouraged to contact the Project Team as listed above.

Comments were collected to assist the Ministry in meeting the requirements of the Regulation. This material will be maintained on file for use during the project and may be included in project documentation. Information collected was used in accordance with the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c. F.31. With the exception of personal information, all comments became part of the public record.

1.4.2.2 Consultation on the Draft Environmental Conditions Report

Consultation was initially carried out for this project under the Ministry of Transportation Class Environmental Assessment for Provincial Transportation Facilities, Group 'A' project. As the Regulation is now in force, the consultation process has been updated to meet the requirements of the new regulation. Further details on the consultation process are summarized in **Section 4** of this Report.

The Notice of Publication of the Draft Environmental Conditions Report was published in the Bradford West Gwillimbury Topic and East Gwillimbury Express newspapers on July 28, 2022. The Notice was also distributed to the Project Contact List through email and airmail delivery, and posted to the Project Website on July 28, 2022, and subsequently on August 12, 2022 due to a delay in posting of the Draft Environmental Conditions Report. This broad distribution of notifications is deemed appropriate to promptly bring the notice to the attention of interested persons in the Study Area and is consistent with the previous project notifications.

In accordance with Section 18(1) of the Regulation, the Ministry engaged and consulted with Indigenous communities and interested persons. Any concerns raised by Indigenous communities and interested persons during the public review period for the Draft Environmental Conditions Report are documented in **Section 7** of the Final Environmental Conditions Report, as required by Section 16(8) of the Regulation.

1.4.2.3 Final Environmental Conditions Report

Upon completion of engagement and consultation on the Draft Environmental Conditions Report, the Ministry updated the Draft Environmental Conditions Report to include a description of concerns raised by Indigenous communities and interested persons; a description of what actions may be undertaken with respect to the concerns raised; and include a description of any changes to the Environmental Conditions Report as a result of addressing these concerns (**Section 7**). The updated Environmental Conditions Report was then issued as Final in accordance with Section 19 of the Regulation and published on the Project Website on October 27, 2022.

1.4.3 Contents of the Environmental Conditions Report

This Environmental Conditions Report has been completed in accordance with Section 16(2), Section 16(3) and Section 19(1) of the Regulation and contains the information outlined in **Table 1-2**.

1.5 Regulatory Context

1.5.1 Ontario Regulation 697/21: Bradford Bypass Project

On October 7, 2021, Ontario Regulation 697/21 came into effect. As outlined in **Section 1.4**, the Regulation provides a streamlined assessment process while ensuring continued engagement and consultation with government agencies, Indigenous communities, and members of the public throughout the project.

1.5.2 Federal Impact Assessment

In June 2019, the Government of Canada released the Impact Assessment Act, providing an outline for the federal assessment of impacts of major projects and projects on federal lands within Canada. The Impact Assessment Act provides a five-phase process to assessing projects subject to the Impact Assessment Act:

- Planning
- Impact Statement
- Impact Assessment
- Decision-Making
- Post Decision

**Table 1-2: Environmental Conditions Report Contents per Ontario Regulation 697/21:
 Bradford Bypass Project**

Regulation Section	Requirement	Report Section
Section 16(2)(1)	A map showing the study area and the technically preferred route.	Section 1
Section 16(2)(2)	An update to the description of the environmental conditions in the Bradford Bypass Environmental Assessment, including any updates from the early works report, if any.	Section 2
Section 16(2)(3)	A description of all studies undertaken in relation to updating the environmental conditions in the study area, including, <ul style="list-style-type: none"> i. a summary of all data collected or reviewed, and ii. a summary of all results and conclusions. 	Section 2
Section 16(2)(4)	An identification of, <ul style="list-style-type: none"> i. any changes to the environmental conditions identified in paragraph 2, 	Section 2
Section 16(2)(4)	<ul style="list-style-type: none"> ii. any changes to the technically preferred route as a result of the changes to the environmental conditions identified in paragraph 2, and iii. at least two alternatives for any changes identified to the technically preferred route identified in subparagraph ii. 	Section 5
Section 16(2)(5)	A description of the changes identified in accordance with paragraph 4, if any, to the technically preferred route and the reasons for the change.	Section 5
Section 16(2)(6)	If there are proposed changes to the technically preferred route identified in accordance with paragraph 4, the contents required by clause (3) (a).	Section 5
Section 16(2)(7)	A description of the proposed updated technically preferred route, subject to the results of the process required by clause (3) (b), if any.	Section 6
Section 16(2)(8)	A consultation record for preparation of the Draft Environmental Conditions report, including, <ul style="list-style-type: none"> i. a description of the consultations carried out with Indigenous communities, in accordance with the Indigenous Consultation Plan prepared under section 15, and with other interested persons, ii. a list of the Indigenous communities and interested persons who participated in the consultations, 	Section 4

Regulation Section	Requirement	Report Section
	<ul style="list-style-type: none"> iii. summaries of the comments submitted by Indigenous communities and interested persons, iv. a summary of discussions that the proponent had with Indigenous communities, and copies of all written comments submitted by Indigenous communities, v. a description of what the proponent did to respond to concerns expressed by Indigenous communities and interested persons, and vi. any commitments made by the proponent to Indigenous communities and interested persons in respect of the Bradford Bypass Project. 	
Section 16(3)	<p>If the proponent determines that changes to the technically preferred route are necessary based on the evaluation in paragraph 4 of subsection (2),</p> <ul style="list-style-type: none"> (a) for any proposed changes within the study area, the Draft Environmental Conditions report must contain, <ul style="list-style-type: none"> (i) the proponent's assessment and evaluation of any impacts that the change might have on the environment, and (ii) a description of any measures proposed by the proponent for mitigating any negative impacts that the change might have on the environment; and 	Section 6
Section 16(3)	<ul style="list-style-type: none"> (b) for any proposed changes outside of the study area, the proponent must, <ul style="list-style-type: none"> (i) evaluate those changes in accordance with the Class Environmental Assessment, and (ii) incorporate the results of the Class Environmental Assessment process into the Draft Environmental Conditions report or the draft environmental impact assessment report to reflect any changes to the technically preferred route. 	Section 6
Section 19(1)	<p>Following the consultation described in section 18, the proponent shall,</p> <ul style="list-style-type: none"> (a) update the draft environmental conditions report, including by adding, <ul style="list-style-type: none"> (i) a description of any concerns raised by Indigenous communities and interested persons, (ii) a description of what, if anything, the proponent did or will do in respect of the concerns raised, and (iii) a description of any changes to the environmental conditions report as a result of addressing concerns raised during consultation under section 18; and (b) publish a final environmental conditions report on the Project Website. 	Section 7

Projects that meet the definition of designated projects under the Physical Activities Regulations (SOR/2019-285) of the Impact Assessment Act are subject to the Impact Assessment Act.

The Ministry reviewed the Physical Activities Regulations (SOR/2019-285) under the Impact Assessment Act in order to reconfirm the applicability and requirements pertaining to the Bradford Bypass. The Ministry considered the applicability of the Bradford Bypass as a 'Designated Project' pursuant to the Impact Assessment Act. Specifically, Section 51 of the Physical Activities Regulations deems the Impact Assessment Act applies to "The construction, operation, decommissioning and abandonment of a new all-season public highway that requires a total of 75 kilometres or more of new right-of-way.", Section 51 of the Physical Activities Regulations does not apply to the Bradford Bypass as it involves less than 75 kilometres or more of new right-of-way.

The following were also considered in the determination of the Bradford Bypass being subject to the criteria of a Designated Project per the Impact Assessment Act:

- The Updated Technically Preferred Route does not impact or impede on federal lands
- The Updated Technically Preferred Route is not located within a Wildlife Area as defined in the Wildlife Area Regulations
- The Updated Technically Preferred Route is not located within a Marine Conservation Area
- The Updated Technically Preferred Route is not located in a migratory bird sanctuary, as defined in the Migratory Bird Sanctuary Regulations
- The Updated Technically Preferred Route is not located on land administered by Parks Canada.

Per review of the applicability of Section 51 of the Physical Activities Regulations and other considerations, the Bradford Bypass does not meet the criteria for a defined 'Designated Project' and, therefore it is not subject to Federal Impact Assessment requirements per the Impact Assessment Act. The Ministry acknowledges that under subsection 9(1) of Impact Assessment Act, the federal Minister of Environment and Climate Change may, by order, designate a physical activity that is not prescribed in the Physical Activities Regulations.

It should also be noted that potential impacts of the project within federal jurisdiction are limited and will be managed through the project-specific assessment of environmental impacts and federal permits and approvals will be obtained as required. The

management and consideration of federal jurisdiction and approvals was initiated during the Route Planning study as part of the 2002 Approved Environmental Assessment alignment. A comprehensive engagement and consultation program with local community members, Indigenous communities, municipalities, and stakeholders has been underway since initiation of the Preliminary Design study in 2020 and will continue through project implementation. The Ministry is actively addressing concerns from Indigenous communities and interested persons and will continue to do so throughout the project lifecycle.

1.5.2.1 Impact Assessment Agency of Canada Designation Request and Minister's Decision

In February 2021, the Minister of Environment and Climate Change received a request to designate the Bradford Bypass under subsection 9(1) of the Impact Assessment Act. Under subsection 9(1) of the Impact Assessment Act, the Minister may, by order, designate a physical activity that is not prescribed in the Physical Activities Regulations. The Minister may do this if, in the Minister's opinion, the physical activity may cause adverse effects within federal jurisdiction or adverse direct or incidental effects (resulting from federal decisions), or public concerns related to those effects that warrant the designation. The Ministry reviewed the project in line with the request, responded in March 2021, and posted the responses on the Project Website. In May 2021, the Minister of the Environment and Climate Change determined that the Bradford Bypass proposed by the Ministry does not warrant designation under the Impact Assessment Act and issued the following statement (Government of Canada, 2021):

The Minister of Environment and Climate Change has considered the potential for the Project to cause adverse effects within federal jurisdiction, adverse direct or incidental effects, public concern related to these effects, as well as adverse impacts on the Aboriginal and treaty rights of the Indigenous peoples of Canada. The Minister also considered the analysis of the Impact Assessment Agency of Canada.

The Minister has reached the decision that the designation of the Project is unwarranted for the following reasons:

- the regulatory review processes that apply to the Project and related consultations with Indigenous peoples provide a framework to address the potential adverse aforementioned effects and public concerns raised in relation to those effects. These include:
 - provincial approvals and permits pursuant to the Environmental Assessment Act, Endangered Species Act, Environmental Protection Act, Ontario Heritage Act, Ontario Water Resources Act, and Safe Drinking Water Act.

- the Project must comply with relevant provisions of federal legislation, including the Canadian Navigable Waters Act, the Fisheries Act, and the Explosives Act.

The May 2021 decision was upheld in February 2022, following a further request for the project to be reviewed under the Federal Impact Assessment Act. The response on February 11, 2022 from the Impact Assessment Agency of Canada stated that since there is no material changes to the Project, there is no basis for the Minister to revise the former Minister's determination. The Bradford Bypass is a non-designated project.

1.5.3 Planning Policies

The Province of Ontario, the County of Simcoe, Regional Municipality of York, Town of Bradford West Gwillimbury, Town of East Gwillimbury and King Township have plans and policies which are relevant to the development of the project. These plans and policies serve as important elements of the planning framework and provide insight into key provincial and municipal objectives, while encouraging strategic transportation development.

The following sections provide an overview of the planning policies relevant to the project.

1.5.3.1 Provincial Planning

This section provides an overview of provincial policy documents that guide land use, growth, infrastructure planning, trade, tourism and recreation, and environmental protection. The following provincial plans are considered to be applicable to the project.

1.5.3.1.1 A Place to Grow: Growth Plan for the Greater Golden Horseshoe

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020 (Growth Plan) is a long-term plan for Ontario designed to promote economic growth, increase housing supply, create jobs, and build communities that make life easier, healthier, and more affordable for people of all ages. As one of the most dynamic and fast-growing regions in North America, the Greater Golden Horseshoe is a designation for many people and businesses relocating from other parts of Canada and around the world. To accommodate such growth, the plan provides a framework to guide and prioritize infrastructure planning and investments in the Greater Golden Horseshoe, including transportation system planning for moving people and moving goods, to support and accommodate forecasted growth to 2051 and beyond (Province of Ontario, 2020b).

The infrastructure framework in the Growth Plan requires that municipalities undertake an integrated approach to land use planning, infrastructure investments, and environmental protection to achieve the outcomes of the Growth Plan.

The Growth Plan supports the planned corridors which are required to meet projected needs, and are identified through the Growth Plan, preferred alignment(s) determined through the Provincial Environmental Assessment Act, processes; or identified through planning studies where the Ministry is actively pursuing the identification of a corridor. The Growth Plan policy dictates that in planning for the development of planned corridors and supporting facilities, the Province, other public agencies, and municipalities will consider increased opportunities for moving people and goods by rail; separation of modes within corridors; and provide opportunities for inter-modal linkages. The Growth Plan calls for the long-term protection of planned corridors and the co-location of infrastructure in these corridors, where appropriate (Province of Ontario, 2020b).

The 2002 Approved Environmental Assessment for the Bradford Bypass is identified on the Growth Plan Schedule 2 – A Place to Grow Concept as ‘Highway Extension’ that crosses the lands designated as Greenfield Area and Greenbelt Area. The Growth Plan defines the ‘Designated Greenfield Area’ as lands within settlement areas but outside of delineated built-up areas that have been designated in an official plan for development and are required to accommodate forecasted growth to the horizon of the Growth Plan.

1.5.3.1.2 Provincial Policy Statement

The Provincial Policy Statement, 2020 is issued under Section 3 of the Planning Act and provides policy direction on matters related to land use planning and development. The Provincial Policy Statement is premised upon the efficient use of land and infrastructure, the protection of environmental resources, and ensuring sufficient land is available for the development of future employment and residential uses.

Of relevance to the Study Area are policies that relate to transportation systems and infrastructure, long-term economic prosperity, and the protection of natural, cultural, and built heritage. In particular, the Provincial Policy Statement promotes:

- Healthy and active communities by facilitating active transportation and community connectivity (Provincial Policy Statement, 2020, Section 1.5.1)
- The planning for and protection of transportation infrastructure and transit to meet current and projected needs (Provincial Policy Statement, 2020, Section 1.6.8.1)
- Providing safe, energy efficient, integrated, and reliable multimodal transportation systems which facilitate the movement of people and appropriately address projected needs (Provincial Policy Statement, 2020, Section 1.6.7)

- Maintaining or restoring the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems (Provincial Policy Statement, 2020, Section 2.1.2)
- Restricting development and site alteration in, or adjacent to, significant wetlands, woodlands, valley lands, wildlife habitat, and Areas of Natural and Scientific Interest, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions (Provincial Policy Statement, 2020, Sections 2.1.4 and 2.1.5)
- Restricting development and site alteration in habitat of endangered or threatened species except in accordance with Provincial and Federal requirements (Provincial Policy Statement, 2020, Section 2.1.7)
- Restricting development and site alteration in or near sensitive surface or groundwater features such that their features and related hydrological functions will be protected, improved, or restored (Provincial Policy Statement, 2020, Section 2.2.2)
- Conservation of significant built heritage resources and significant cultural heritage landscapes (Provincial Policy Statement, 2020, Section 2.6.1)
- Restricting development and site alteration on lands containing archaeological resources or areas of archaeological potential unless significant archaeological resources have been conserved (Provincial Policy Statement, 2020, Section 2.6.2)
- Restricting development and site alteration on adjacent lands to protected heritage properties, except where the proposed development and site alteration has been evaluated and demonstrated that the heritage attributes will be conserved (Provincial Policy Statement, 2020, Section 2.6.3)
- Promotion of archaeological management plans and cultural plans (Provincial Policy Statement, 2020, Section 2.6.4)
- Engagement with Indigenous communities and consideration of their interests when identifying, protecting, and managing cultural heritage and archaeological resources (Provincial Policy Statement, 2020, Section 2.6.5).

The Bradford Bypass is consistent with the objectives of the Provincial Policy Statement as it supports the expansion and optimization of a multi-modal transportation system that provides connectivity to existing local and regional transportation infrastructure and supports long-term economic prosperity. The Bradford Bypass will also support areas that are planned for residential and employment growth.

1.5.3.1.3 Greenbelt Plan 2017

The Greenbelt Plan, 2017, identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological and hydrological features, areas, and functions occurring within the Greater Golden Horseshoe landscape (Province of Ontario, 2017). The Greenbelt Plan was introduced in 2005 under the Greenbelt Act, 2005, and includes lands within, and builds upon the ecological protections provided by, the Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Plan. The Greenbelt Plan, together with the Growth Plan, builds on the Provincial Policy Statement to establish a land use planning framework for the Greater Golden Horseshoe that supports a thriving economy, a clean healthy environment, and social equity (Province of Ontario, 2017).

1.5.3.1.4 Lake Simcoe Protection Plan

The Lake Simcoe Protection Plan was prepared with the objective of protecting, improving and restoring the elements that contribute to the ecological health of the Lake Simcoe watershed (Province of Ontario, 2009). The Plan outlines actions to address the most critical issues affecting the health of the Lake Simcoe including:

- Restoring the health of aquatic life within the Lake Simcoe watershed
- Improving water quality, including loadings of phosphorous to the lake
- Maintaining water quantity
- Improving the health of the ecosystem by protecting and rehabilitating important areas, such as shorelines and natural heritage
- Addressing impacts of invasive species, climate change, and recreational activities.

The Lake Simcoe Protection Plan was approved on June 2, 2009, under the Lake Simcoe Protection Act (Province of Ontario, 2009). The Bradford Bypass Study Area traverses through lands within the Lake Simcoe Watershed. The Lake Simcoe Protection Plan contains policies regarding fish and fish habitat, water quality and quantity, stormwater management, and terrestrial ecosystems for development projects within the Lake Simcoe Watershed.

1.5.3.2 Municipal Planning

1.5.3.2.1 County of Simcoe Official Plan, 2008 (Office Consolidation 2016)

The Official Plan for the County, 2016, is prepared under the Planning Act. The final consolidated text for the Official Plan was approved for the County by the Ontario Municipal Board in December 2016. This Official Plan provides a policy context for land

use planning taking into consideration the economic, social, and environmental impacts of land use and development decisions within the County.

The County is expecting continued population growth to the year 2031. Population within the County is projected to increase by 53%, from 272,000 (County of Simcoe, 2016) to 416,000 in 2031.

It is the County's policy that land use planning and development decisions within the County shall be integrated with transportation considerations. The County, along with local municipalities, plan for and infrastructure corridors and right-of-way to meet current and projected needs. Where development in 'Planned Corridors' could preclude or negatively affect the use of the corridor for the purposes for which it was identified, the development shall not be permitted. The County will encourage and support the planning, corridor and connectivity protection and the early construction of Provincial Planned Corridors, as a goods movement and transit corridor. The Bradford Bypass has been identified as 'Potential Provincial Corridor' in Schedule 5.5.2 of the Official Plan - Future County Transportation System.

The Bradford Bypass traverses the lands designated as Settlements Area, Agricultural Lands, Greenlands, Highway 400 Employment lands and the Protected Countryside in the Greenbelt Plan. The Official Plan states that where feasible and subject to local municipal policies and By-Laws, infrastructure may be located in any designation of the Official Plan, subject to the requirements of the Greenbelt Plan where applicable, and applicable provincial and federal policy and legislation. Lot creation for infrastructure in the Agricultural designation is discouraged and should only be permitted where the use cannot be accommodated through an easement or right-of-way.

1.5.3.2.2 Regional Municipality of York Regional Official Plan, 2010

The York Region Official Plan, 2010, is prepared under the Planning Act. A Municipal Comprehensive Review was initiated to inform the update to the 2010 Regional Official Plan (York Region, 2019) to accommodate expected growth to approximately 2.02 million people and 990,000 jobs by 2051. The updated Official Plan will guide the Region's growth to the year 2051 and help ensure the Region is building communities where current and future residents of all abilities and ages can live, work and play (York Region, 2019). The draft Official Plan was presented to York Regional Council on November 11, 2021.

The policies outlined in the Official Plan guide the economic, environment and community building decisions to manage growth within the Region. The Official Plan policies include enhancing mobility systems to connect land use and transportation planning (York Region, 2010). Where development in 'Planned Corridors' could preclude or negatively

affect the use of the corridor for the purposes for which it was identified, the development shall not be permitted. The Region will encourage and support the planning, corridor and connectivity protection and the early construction of Provincial Planned Corridors, as a goods movement and transit corridor. The Bradford Bypass has been included in the list of corridors and facilities to be protected by local municipalities and the Province in Schedule 7.2.52 in the Official Plan (York Region, 2010).

1.5.3.2.3 County of Simcoe Transportation Master Plan, 2014

The County has emerged as a key growth area in the outer ring municipalities surrounding the Greater Toronto and Hamilton Area. Not only is the demand for growth a major challenge facing the County's transportation system, but the recreational communities within and just to the north and west of the County dramatically increase the travel demands on the weekends and particularly during the summer months (County of Simcoe, 2014).

Since the completion of the County's Transportation Master Plan, the County and its local municipalities continue to experience growth in employment and tourism, as well as seasonal and year-round residents. The Transportation Master Plan provided a fundamental framework for the County's planned transportation corridors and systems.

According to the Transportation Master Plan, increasing the supply of transportation infrastructure and services and construction of new transportation facilities will be a strategy direction to address the transportation challenges facing the County. The Transportation Master Plan also refers to the information gathered from the public survey which indicated that 86% of the respondents supported the idea of working with the provincial government to complete new highways, including the Bradford Bypass. Additionally, staff from 18 Simcoe Area municipalities identified the implications of a deferred Bradford Bypass and the impact on County roads as one of the specific areas of 'Road Network Concerns'. In support of implementation, phasing and monitoring of the key Transportation Master Plan strategies, Transportation Master Plan recommended that the County should engage in discussions with the Ministry to move forward in the construction of the Bradford Bypass. Protection of lands for this facility should persist and implementation of a facility in this corridor should continue to be a high priority for the County and the Province as it has been identified as a near-term need to accommodate growth and to facilitate goods movement and future transit movements.

The Transportation Master Plan was updated in 2014 to proceed toward an integrated transportation network with additional focus on transit services and nodes, active transportation amenities, as well as a review of County road design standards, cross-sections, and right-of-way widths. It has been assumed in the updated Transportation Master Plan that the Bradford Bypass will be constructed.

2021 Transportation Master Plan Update

Simcoe County initiated a Transportation Master Plan Update in February 2021, which is currently in Phase 2 of a four-stage study process (County of Simcoe, 2021).

According to the County's website (<https://www.simcoe.ca/dpt/pln/tmp>), the Transportation Master Plan update will:

- Develop a forward-looking plan for the County and expand the multi-modality of the transportation system including driving, transit, cycling, walking and movement of commercial vehicles
- Identify appropriate infrastructure to support and manage growth and address the needs and priorities of both rural and urban communities
- Develop complementary transportation solutions informed by supporting provincial and local policies including the Official Plan update
- Provide recommendations on managing a multi-modal transportation system, improving safety, and supporting the development of healthy communities.

The intention of the update is to identify potential transportation improvements for all modes of travel: driving, transit, cycling, walking and goods movement. Updating the Transportation Master Plan will help support the County of Simcoe's vision for its future transportation system and ensure that current issues and growth are responded to with an increased focus on transit, active transportation and the environment.

On October 5, 2021, the County released Phase I of the Transportation Master Plan update. As the County continues to experience population growth and urbanization, this update provides an opportunity to realign transportation policy and investment directions to best meet the varied transportation needs, by considering all modes of travel (County of Simcoe, 2021). The strategic direction for the Transportation Master Plan update consists of three components: the transportation Vision Statement, Goals, and Guiding Principles. The Vision Statement is as follows:

“A safe, efficient and accessible multi-modal transportation system that responds to the County's vast geography, provides the connectivity needed for its growing and changing populations and businesses, and supports community and environmental health.”

The Goals follow from and break down the Vision Statement into a set of specific desired outcomes. Specific goals that the Bradford Bypass addresses includes providing efficient and safe travel between County communities and to adjacent municipalities via the County road network and supporting the local economy by enabling efficient movement of goods and commercial vehicles.

The Guiding Principles overarch the Vision Statement and act as building blocks for the development of the Transportation Master Plan update. Guiding principles that the construction of the Bradford Bypass addresses include:

- Establishing an efficient and integrated multi-modal transportation network
- Supporting safe and reliable movement of people and goods
- Integrative transportation and land use planning.

This is because the Bradford Bypass is a future infrastructure expansion project that will have significant impacts on local roads in Bradford West Gwillimbury and provide placemaking opportunities as a result of reduced traffic (County of Simcoe, 2021). The Bradford Bypass is expected to accommodate the additional travel demand in the County and may relieve congestion on some County Roads (County of Simcoe, 2021).

1.5.3.2.4 Town of Bradford West Gwillimbury Official Plan, 2021

The Town of Bradford West Gwillimbury is strategically located along Highway 400 within the County, between the Town of Newmarket and City of Barrie. New growth is transforming the form and layout of Bradford West Gwillimbury. According to the 2016 Census, the Town of Bradford West Gwillimbury's population and employment numbers were approximately 36,700 persons and 10,000 jobs respectively. Growth projections as contained in the Greater Golden Horseshoe 2019 and the County Official Plan 2008 (Bradford West Gwillimbury, 2016) state that the Town of Bradford West Gwillimbury's population will reach 50,500 people and 18,000 jobs by the year 2031.

The Bradford West Gwillimbury's Official Plan was adopted by Town Council on March 2, 2021 (Bradford West Gwillimbury, 2021) and is focused on sustainability and establishes policies that have a positive effect on the social, economic, cultural, and natural environment of the Bradford West Gwillimbury. The submission and approval of the 2002 Approved Environmental Assessment document for the Bradford Bypass has been of particular importance and it is Bradford West Gwillimbury's Policy to ensure that development in the vicinity of the highway will be compatible with the functioning of the highway and its access points.

Section 3.11.3 of the Bradford West Gwillimbury Official Plan recognizes the Bradford Bypass corridor and indicates that lands within the Bradford Bypass shall only be permitted to be used for their legal existing purposes. Any expansion of use or building shall require a development application and Ministry permit in accordance with the Public Transportation and Highways Improvement Act to ensure there is no adverse impact on the future corridor. Development proposals adjacent to the Bradford Bypass shall, as part of reviewing the application, consult with the Ministry to ensure all appropriate requirements are met (Bradford West Gwillimbury, 2021).

1.5.3.2.5 Town of Bradford West Gwillimbury Transportation Master Plan

The Town of Bradford West Gwillimbury is currently updating their Transportation Master Plan to consider the future community in terms of population, business growth, residential development, commuter needs and land use plans to determine transportation needs for the community (Town of Bradford West Gwillimbury, no date). The updated Transportation Master Plan will lay out a guide for sustainable, efficient and safe movement of goods and people, and serve as an evidence-based tool to guide the congestion reduction initiatives within the Town of Bradford West Gwillimbury (Town of Bradford West Gwillimbury, no date).

The Town of Bradford West Gwillimbury provided recommendations for the Transportation Master Plan in June 2022, which were put in motion by Council.

1.5.3.2.6 Town of East Gwillimbury Transportation Master Plan

The Town of East Gwillimbury is currently updating their 2010 Transportation Master Plan. The updated Transportation Master Plan will identify the long term transportation goals of the Town of East Gwillimbury and identify specific solutions that will require further studies (Town of East Gwillimbury, no date). The updated Transportation Master Plan will include:

- Reviewing the short-term action items identified in the Town of East Gwillimbury's 2010 Master Plan. Then providing an update on the York Region's 2016 Transportation Master Plan and outlining its impacts on the Town of East Gwillimbury.
- Assessing the current transportation network.
- Identifying gaps and opportunities for all travel modes, including the consideration of provincial, regional, and adjacent municipal plans and emerging transportation trends.
- Meeting the requirements of Phases one and two of the Municipal Class Environmental Assessment process by assessing current travel conditions; the impacts of growth and defining these issues in a problem and opportunity statement; identifying and evaluating alternative solutions to address the problem and opportunity statement; and selecting a preferred alternative for a sustainable, multimodal transportation network that decreases auto dependency and is accessible to all.
- Reaching out to the public and stakeholders through public engagement process.
- Identifying policies that support the recommended multimodal network.

- Manage travel demand in peak periods. Including Travel Demand Management. Transit-oriented development policies, traffic safety and calming and community-oriented traffic control policies.
- Establishing detailed action, implementation and monitoring plans for transportation network initiatives that are carried through to a “project ready” mode.
- Provide input to the Town’s Official Plan and Development Charges Background Study.

1.5.3.2.7 King Township Transportation Master Plan, 2020

King Township updated their 2015 Transportation Master Plan to reflect continued growth in its communities, changes to policies across multiple levels of government, and to continue to be responsive to travel needs within King Township by a variety of modes of transportation (King Township, 2020). The purpose of the Transportation Master Plan update was to incorporate updated population and employment forecasts to the year 2031.

The objectives of the updated Transportation Master Plan are to:

- Plan transportation infrastructure that accommodates all users of all abilities
- Promote alternative modes of transportation to the private vehicle to address the impacts on climate change
- Create sustainable and comfortable streets that are safe for pedestrians and cyclists
- Provide a road classification system to guide future planning and capital works.

1.5.3.2.8 Town of East Gwillimbury Official Plan, 2018

The Town of East Gwillimbury is located north of Toronto and consists of the communities of Holland Landing, River Drive Park, Sharon, Queensville and Mount Albert. The Town is expected to grow to a resident population of 86,500 with over 34,000 jobs (Town of East Gwillimbury, 2018).

The Town of East Gwillimbury Official Plan was adopted by Town Council on June 28, 2010. It provides direction and a policy framework for managing growth and land use decisions until 2031, including long term protection of environmental areas, cultural heritage features, historic community identity and rural countryside (Town of East Gwillimbury, 2018).

Section 7.2.4.2 of the Official Plan classifies the Bradford Bypass as a proposed Provincial Highway, and provides policies specific to the Bradford Bypass, relating to:

- Providing active transportation connections between Employment Areas and Community Areas on each side of the Bradford Bypass, while considering design elements
- Providing connectivity options to support the continuation of farming operations in the area surrounding the Bradford Bypass
- Inclusion of commuter parking facilities with transit connections at proposed interchanges
- Providing collector road connections to improve connectivity and access to designated employment areas.

Section 7.2.4.2 also notes that Schedule E of the Official Plan will be reviewed following the completion of the project-specific assessment of environmental impacts for the Bradford Bypass to consider any changes to the road network outlined in Schedule E. Until the review is completed, the Plan assumes that the Technically Preferred Route for the Bradford Bypass will be maintained, and any actions that would impact the potential location of the Technically Preferred Route is discouraged (Town of East Gwillimbury, 2018).

1.5.3.2.9 Township of King Official Plan, 2019

The Township of King is located within York Region, just north of the Greater Toronto Area consisting of the villages of King City, Nobleton and Schomberg. The Township of King Official Plan establishes a policy framework that accommodates expected population growth to 34,900 by the year 2031 (Township of King, 2019). The Township of King Official Plan establishes a comprehensive set of policies to guide growth and development, land use, environmental conservation and restoration, advance economic development activities, promote heritage conservation, and guide infrastructure, while emphasizing the Townships unique character and heritage (Township of King Official Plan, 2019).

Section 8.5.4 of the Official Plan states that any expansion of use or building shall require a development application and Ministry permit in accordance with the Public Transportation and Highways Improvement Act to ensure there is no adverse impact on the future corridor. Development proposals adjacent to the Bradford Bypass shall, as part of reviewing the application, consult with the Ministry to ensure all appropriate requirements are met (Bradford West Gwillimbury, 2021).

1.5.4 Permits, Licences, Approvals, Authorizations and Applicable Regulatory Frameworks

The Ministry is undertaking a wide range of environmental discipline studies including field investigations will be carried out as part of this project, as related to natural, socio-economic, cultural, and technical disciplines. All studies will be undertaken in accordance with current legislative requirements, standards and best practices, including the Ministry of Transportation Environmental Guides and the Environmental Reference for Highway Design. These studies will assess the project-specific environmental impacts associated with each discipline, identify mitigation measures and document future commitments as required. These studies will adhere to all relevant new and existing provincial and federal legislation. The list presented in **Table 1-3** is considered applicable to the project and was presented as part of the federal review of the project under the Impact Assessment Act in 2021. As the study progresses, this list will be updated and documented in the Environmental Impact Assessment Report, and commitments carried forward through future stages of design and construction.

In addition to those legislative requirements where approvals may be required (**Table 1-3**), the following are additional legislative requirements considered as part of the study:

- Migratory Bird Convention Act
- Public Transportation and Highway Improvement Act, R.S.O. 1990. c. P.50
- Lake Simcoe Protection Plan
- Lake Simcoe Protection Act, 2008, S.O. 2008, c. 23
- Lakes and Rivers Improvement Act, 1990
- Environmental Assessment Act, Ontario Regulation 697/21
- Environmental Assessment Act, Class Environmental Assessment Act for Transportation Facilities
- Greenbelt Plan
- Planning Act (1990) and Provincial Policy Statement (2020)
- Ontario Heritage Act, R.S.O. 1990, c.018
- Municipal Noise By-Laws
- Ontario Regulation 179/06
- Ontario Regulation 172/06

Table 1-3: Summary of Potential Permits, Licences, Authorizations or Approval Requirements for the Project

Permits, Licences, Approvals & Authorization Associated Legislative Framework Responsible Jurisdiction	Description
<ul style="list-style-type: none"> ■ Fisheries Act Authorization ■ Fisheries and Oceans Canada ■ Should the project have the potential to result in the death of fish or Harmful Alteration Disruption, Destruction, Fisheries and Oceans Canada review will be required to determine the need for an authorization under the Fisheries Act 	<ul style="list-style-type: none"> ■ The project will be assessing to determine if there is the potential for project activities to result in the death of fish or Harmful Alteration Disruption, Destruction of fish and fish habitat including Species at Risk and impacts to Indigenous communities. ■ If approval and/or permits are required through consultation with Fisheries and Oceans Canada, the following assessment information would be provided: <ul style="list-style-type: none"> – Construction methods and details on all phases (mitigation measures, construction, operation, maintenance, closure) including engineering drawings. – Information on fish habitat, fish community, watershed, wetlands, waterbodies near the construction footprint. ■ Public and Indigenous engagement and consultation undertaken as described in Section 4. ■ The project will be assessed to determine if there is potential for project activities to result in the death of fish or harmful alteration disruption, destruction of fish and fish habitat including species at risk.
<ul style="list-style-type: none"> ■ Application for Approval for Schedule Waterway under Canadian Navigable Waters Act ■ Transport Canada ■ Under Section 9 and Section 10 of the Canadian Navigable Waters Act, approval for bridge work as defined under the Major Works Order for works over a scheduled waterway ■ Transport Canada Navigation Protection Program administers the Act 	<ul style="list-style-type: none"> ■ Under the Canadian Navigable Waters Act, owners of works who propose to construct, place, alter, rebuild, remove or decommission works that are in, on, over, under, through or across any navigable water may be required to apply for an approval to Transport Canada, or seek authorization through the public resolution process. ■ As part of the Preliminary Design, the Ministry will consider the legislative requirements and consult with Transport Canada under the Act for the proposed crossings of the Holland River and Holland River East Branch. Both watercourses are identified as Schedule Waterways per Paragraph 5(1)(b) and subsections 10(1) and (2) and 29(1) to (3), Part 2 “Rivers and Riverines” of the Act. ■ As part of consultation, the Ministry is seeking input from the public and key stakeholders to understand navigation uses to facilitate design development of the structures and support approval requirements.
<ul style="list-style-type: none"> ■ Species at Risk Act ■ Environment and Climate Change Canada 	<ul style="list-style-type: none"> ■ The goal of the Act is to monitor and protect disappearing species; provide recovery strategies for Extirpated, Endangered or Threatened species, as well as to manage species of Special Concern. ■ For wildlife species, this legislation generally applies to federal lands or projects or approvals administered by a federal agency or provincial lands without equivalent protection. ■ The following federally listed species have potential to be present within the Study Area: Jefferson Salamander, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Easter Meadowlark, Eastern Whip-poor-will, Henslow’s Sparrow, Least Bittern, Louisiana Waterthrush, Little Brown Myotis (Bat), Northern (Long-eared) Myotis (Bat), Tri-colored Bat, Butternut, Blanding’s Turtle, ■ All of the above species are protected under the Ontario Endangered Species Act.
<ul style="list-style-type: none"> ■ Permit to Take Water ■ Ministry of the Environment, Conservation and Parks ■ Required if temporary water takings are estimated to be greater than 400,000 L/day for dewatering during construction activities in accordance with the Water Resources Act (O. Reg. 128/03) Section 34 	<ul style="list-style-type: none"> ■ Further consultation with the Agency will occur. If permits are required, the appropriate approval package will be submitted. ■ The permit includes requirements to assess impacts to surface and groundwater quantity and quality due to project activities. ■ The permit places limits on the quantity and duration of water taken and requires reporting.

Permits, Licences, Approvals & Authorization Associated Legislative Framework Responsible Jurisdiction	Description
<ul style="list-style-type: none"> ■ Environmental Activity and Sector Registry for construction dewatering ■ Ministry of the Environment, Conservation and Parks ■ Required if temporary water takings of groundwater and stormwater for the purpose of construction dewatering have volumes estimated to be greater than 50,000 L/day, but less than 400,000 L/day under normal conditions in accordance with O. Reg. 245/11 Registrations Under II.1 of the Water Resources Act – General and O. Reg. 63/16: Registrations Part II.2 of the Act – Water Taking. 	<ul style="list-style-type: none"> ■ Pending Detail Design, the registration would be obtained as required. ■ Registration information needs to remain up-to-date and the water takings must continue to meet the criteria set out in O. Reg. 245/11 and O. Reg. 63/16, as applicable. ■ Limited to prescribed activities: <ul style="list-style-type: none"> – Taking of ground and/or stormwater of the purpose of dewatering a construction site. – the use, operation, establishment, alteration, extension or replacement of a sewage works that is used solely for the collection, transmission and disposal of stormwater to dewater a construction site.
<ul style="list-style-type: none"> ■ Environmental Compliance Approval for Industrial Sewage ■ Ministry of the Environment, Conservation and Parks ■ Ontario Water Resources Act Section 53 under the Environmental Protection Act 	<ul style="list-style-type: none"> ■ Industrial sewage works are works involving the collection, transmission, treatment or disposal of sewage generated from industrial activities. This could include projects to handle storm runoff, domestic sewage and process sewage from industrial sites. ■ An Approval for Industrial Sewage may be required if changes to existing sewers, stormwater management facilities and stormwater pumping stations are required as a result of Detail Design. This may either require an amendment to an existing Approval(s) or a new Approval.
<ul style="list-style-type: none"> ■ Drinking Water Works Permit ■ Ministry of the Environment, Conservation and Parks ■ Safe Drinking Water Act, 2002, O. Reg. 170/03 	<ul style="list-style-type: none"> ■ Pending Detail Design; may be required to alter drinking water system. ■ Impacts to existing licenced operation systems will be identified and the appropriate licences will be engaged to determine potential impacts to the existing drinking water system to determine permitting requirements. ■ If required, impacts will be mitigated to the extent feasible and alternation would be completed in accordance with the terms and conditions of the permit. ■ The conditions of the Permit and the licence will apply, as applicable, to the additions, modifications, replacements or extensions of the drinking water system authorized by the issuance of a Schedule C (Authorization to Alter the Drinking Water System) document.
<ul style="list-style-type: none"> ■ On-site and Excess Soil Management ■ Ministry of the Environment, Conservation and Parks ■ Approval and/or permits may be required under O. Reg. 406/19 to address excess soil management requirement. 	<ul style="list-style-type: none"> ■ Applicability to be determined pending Detail Design. ■ Volume, quality and soil condition to be determined as part of construction planning process. ■ Management guidelines to be completed and outline sampling, monitoring, handling and documentation requirements. ■ Management of Excess Soils to be completed under the supervision of a Qualified Person as prescribed.
<ul style="list-style-type: none"> ■ Record of Site Condition / Certificate of Property Use ■ Ministry of the Environment, Conservation and Parks ■ Records of Site Condition to be filed with Ministry of the Environment, Conservation and Parks as required as per O. Reg. 153/04. Certificate of Property use may be issued by Ministry of the Environment, Conservation and Parks in accordance with O. Reg. 153/04 	<ul style="list-style-type: none"> ■ Assessment includes: <ul style="list-style-type: none"> ■ Identification of contamination through investigative drilling and soil sampling; ■ Risk assessments to identify required risk management measures; and ■ The development of remediation plans.
<ul style="list-style-type: none"> ■ Endangered Species Act Permit ■ Ministry of the Environment, Conservation and Parks ■ Permit under s. 17(1) in accordance with clause 17(2)(c) of the Act 	<ul style="list-style-type: none"> ■ Under the Act, species are listed as Extirpated, Endangered, Threatened and Special Concern. ■ The Act prohibits the killing, harming or harassment of Endangered or Threatened species and the damage or destruction of their habitat. ■ The project will be assessed to determine if there is any potential for project activities to result in impacts to species at risk. ■ Should impacts be identified, a permit will be prepared to provide species-specific survey, mitigation, monitoring and compensation requirements. ■ The following species have potential to be present within the Study Area: Jefferson Salamander, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Easter Meadowlark, Eastern Whip-poor-will, Henslow's Sparrow, Least Bittern, Louisiana Waterthrush, Little Brown Myotis (Bat), Eastern Small-footed Myotis (Bat), Northern (Long-eared) Myotis (Bat), Tri-colored Bat, Butternut, Blanding's Turtle

Permits, Licences, Approvals & Authorization Associated Legislative Framework Responsible Jurisdiction	Description
<ul style="list-style-type: none"> ■ Fish and Wildlife Conservation Act ■ Ministry of Natural Resources and Forestry 	<ul style="list-style-type: none"> ■ The Act restricts the hunting and trapping of fish species outlined in the Act. ■ The project will be assessed to determine if there is any potential for project activities to result in impacts to fish and fish habitats. ■ Should impacts be identified, a permit or license will be obtained.
<ul style="list-style-type: none"> ■ Archaeology Assessment Review Letters ■ Ministry of Citizenship and Multiculturalism ■ Ontario Heritage Act 	<ul style="list-style-type: none"> ■ Upon confirmation that the Stage 1, 2, 3, and 4 (as applicable) archaeology assessments have met field work and licencing requirements, the Agency will issue a letter confirming their entry into the Ontario Public Register of Archaeological Reports.
<ul style="list-style-type: none"> ■ Minister's Consent ■ Ministry of Citizenship and Multiculturalism ■ Ontario Heritage Act, Part III.1 ■ Standards and Guidelines for Conservation of Provincial Heritage Properties 	<ul style="list-style-type: none"> ■ As a provincial ministry, the Ministry is subject to the Standards and Guidelines for Conservation of Provincial Heritage Properties (the Standards and Guidelines) issued under the Ontario Heritage Act. ■ Consent of the Minister of Citizenship and Multiculturalism is required for the demolition or removal of any buildings or structures on a provincial heritage property of provincial significance or for transfer of the property, in whole or in part, out of provincial control. The Minister may grant consent, with or without conditions, where the Minister is of the opinion that the removal, demolition or transfer is the best option after all alternatives have been considered by the ministry or prescribed public body requesting consent. ■ Compliance with the Provincial Policy Statement (2020).
<ul style="list-style-type: none"> ■ Local Planning Appeal Tribunal Approval of Road Closure ■ Planning Act, Municipal Act, Expropriations Act 	<ul style="list-style-type: none"> ■ The Local Planning Appeal Tribunal is an independent administrative tribunal that hears applications and appeals on municipal and planning matters such as zoning by-laws, subdivision plans, official plans, consents and minor variances under the Planning Act, land compensation matters under the Expropriations Act, and objections to municipal proposals to borrow to finance capital works under the Municipal Act and other legislation.
<ul style="list-style-type: none"> ■ Site Plan Review ■ Township of King, Town of East Gwillimbury, Town of Bradford West Gwillimbury 	<ul style="list-style-type: none"> ■ Although a site plan review is not required for a provincial undertaking, the Ministry will work with municipalities to review proposed site plans that may include but are not limited to, potential for future commuter parking lots, connection with existing or proposed public transit, connection with active transportation plans.
<ul style="list-style-type: none"> ■ Sewer discharge permit ■ York Region and Bradford West Gwillimbury ■ Sewer Use By-law 	<ul style="list-style-type: none"> ■ Although the Ministry is not required to obtain municipal permits, any discharges to storm sewers will be assessed to determine if there is potential for project activities to result in the death of fish or harmful alteration, disruption or destruction of fish habitat including species at risk.
<ul style="list-style-type: none"> ■ Good Forest Practices Permit and/or Special Permits ■ York Region and Simcoe County ■ Forest Conservation By-laws 	<ul style="list-style-type: none"> ■ Although the Ministry is not required to obtain municipal permits, the Project Team is aware of the municipal by-laws regarding forest conservation and will work with York Region and Simcoe County to discuss avoidance and mitigation of potential tree removals.
<ul style="list-style-type: none"> ■ Demolition Permits ■ Township of King, Town of East Gwillimbury, Town of Bradford West Gwillimbury, York Region, Simcoe County 	<ul style="list-style-type: none"> ■ Demolition permits may be required from municipalities should structures require demolition.
<ul style="list-style-type: none"> ■ Road Occupancy Permit / Road Closure Permits ■ Township of King, Town of East Gwillimbury, Town of Bradford West Gwillimbury, York Region, Simcoe County 	<ul style="list-style-type: none"> ■ Road Occupancy Permits / Road Closure Permits may be required for any lane closures or full temporary road closures of municipal roads during construction or investigations. These may be in the form of permits or agreements with the municipality.
<ul style="list-style-type: none"> ■ Permission to Enter and Construct agreement, Permanent or Temporary Limited Interest agreement ■ Ministry of Transportation and landowner 	<ul style="list-style-type: none"> ■ Should the design require works to be completed on private property not owned by the Ministry, a Permission to Enter and Construct agreement or a Permanent or Temporary Limited Interest agreement between the Ministry and the landowner must be obtained.
<ul style="list-style-type: none"> ■ Encroachment Permits ■ Ministry of Transportation 	<ul style="list-style-type: none"> ■ Encroachments may include signs, survey work, banners, acceleration and deceleration lanes, curbs, gutters, sidewalks, safety islands, sewers, pipelines, coaxial or fibre optic cable, or other works or structures that may during the construction, installation, or maintenance thereof, obstruct, cause material to be deposited upon, enter upon, take up, bridge over, tunnel under or in any way interfere with the land within the limits of a highway or the roadway or any structure forming a part of the highway.

Permits, Licences, Approvals & Authorization Associated Legislative Framework Responsible Jurisdiction	Description
<ul style="list-style-type: none"> ■ Environmental Compliance Approval for Air / Noise ■ Ministry of Environment Conservation and Parks ■ Section 9 of the Environmental Protection Act; O. Reg. 419/05 Air Pollution and Local Air Quality; Environmental Noise Guidelines – Stationary and Transportation Sources – Approval and Planning (NPC-300) 	<ul style="list-style-type: none"> ■ For activities as described in Section 9 of the Environmental Protection Act, projects must demonstrate compliance with current air standards at points of impingement and current noise and vibration standards. ■ An Approval for Air/Noise is not required for transportation corridors but may be required for support sites such as work yards and fixed locations with addresses.
<ul style="list-style-type: none"> ■ Environmental Activity and Sector Registry for Air/Noise ■ Ministry of Environment Conservation and Parks ■ O. Reg. 1/17 Registrations under Part II.2 of the Environmental Protection Act – Activities Requiring Assessment of Air Emissions 	<ul style="list-style-type: none"> ■ Pending Detail Design, prescribed activities outlined in O. Reg. 1/17 must be registered in the Environmental Activity and Sector Registry. ■ This registration requires completion of modelling to demonstrate compliance with air, noise and/or vibration criteria. ■ A registration is not required for transportation corridors but may be required for support sites such as work yards and fixed locations with addresses.

2. Environmental Conditions and Engineering Studies

This section describes the natural, socio-economic, and cultural aspects of the existing environment present within the Study Area. The purpose of characterizing the existing environmental conditions is to establish a baseline condition to use for the assessment of preliminary potential impacts and proposed mitigation measures, described in **Section 6**.

Information on the following environmental components is provided in the sections below and, where applicable, is supplemented with supporting detailed draft technical reports and/or data (under separate cover):

- **Natural Environment: Section 2.1**
 - Terrestrial ecosystems: **Section 2.1.1**
 - Fish and fish habitat: **Section 2.1.2**
 - Stormwater and drainage: **Section 2.1.3**
 - Groundwater and hydrogeology: **Section 2.1.4**
 - Fluvial geomorphology: **Section 2.1.5**
- **Social and Economic Environment: Section 2.2**
 - Land use and property: **Section 2.2.1**
 - Agriculture: **Section 2.2.2**
 - Noise and vibration: **Section 2.2.3**
 - Air quality: **Section 2.2.4**
 - Contamination, waste, and excess materials management: **Section 2.2.5.**
- **Cultural Environment: Section 2.3**
 - Archaeology: **Section 2.3.1**
 - Built heritage and cultural heritage landscapes: **Section 2.3.2.**
- **Engineering Studies: Section 2.4**
 - Traffic and transportation: **Section 2.4.1**
 - Geotechnical: **Section 2.4.2**
 - Utilities: **Section 2.4.3.**

In addition to the above discipline studies, a Human Health Risk Assessment as well as a Snow Drift analysis will be completed for Updated Technically Preferred Route. Details regarding the Human Health Risk Assessment as well as the Snow Drift will be documented in the Environmental Impact Assessment Report, under separate cover.

2.1 Natural Environment

Natural environment studies are being carried out (2019 to present) to document and assess existing natural environment features, outline the preliminary description of potential impacts of the project on the natural environment, outline a description of potential measures to mitigate those impacts and identify applicable municipal, provincial, federal, or other regulatory approvals or permits associated with the natural environment that may be required for the project.

Natural environment existing conditions information will be detailed in discipline-specific existing condition and impact assessment reports or memorandums to be completed during the Preliminary Design. The sections below summarize the study methodologies and describe the existing environmental conditions for the following aspects of the natural environment to date (note some discipline works are still ongoing and final details will be documented in the Environmental Impact Assessment Report, under separate cover):

- Terrestrial Ecosystems
- Fish and Fish Habitat
- Stormwater and Drainage
- Groundwater and Hydrology
- Fluvial Geomorphology.

2.1.1 Terrestrial Ecosystems

The Terrestrial Ecosystem study examines the following aspects of the natural environment. The information was updated in 2019 and continued through the current Preliminary Design:

- Designated Natural Areas
- Vegetation Community and Plant Inventory
- Wildlife and Wildlife Habitat
- Species at Risk
- Significant Wildlife Habitat and Species at Risk.

The following sections outline the background, data collection and describe the existing environmental conditions within the Terrestrial Ecosystems Study Area.

2.1.1.1 Background

The 2002 Approved Environmental Assessment included a detailed description of terrestrial ecosystems environmental conditions and commitments that were carried forward and considered in later stages of the project planning processes.

As part of the preparatory work for the re-initiation of the Bradford Bypass in 2020, AECOM generated a Terrestrial Ecosystems Existing Conditions Report (AECOM, 2020), which provided a description of existing terrestrial ecosystems environmental conditions, summarized below:

- 12 designated natural areas were identified within the Study Area
- 454 plant species were identified within the Study Area, including one Endangered Species at Risk and four Species of Conservation Concern
- One confirmed Significant Wildlife Habitat and 24 candidate Significant Wildlife Habitats were identified within the Study Area
- 16 Species at Risk were identified with potential to occur within the Study Area.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with terrestrial ecosystems including applicable legislation and environmental conditions. As such, an update to the description of the environmental conditions within the Terrestrial Ecosystems Study Area is included in the following sections below.

2.1.1.2 Data Collection

A background review was completed prior to field investigations, and the results of the background review are documented in the Highway 400 – Highway 404 Link (Bradford Bypass W.O. #19-2001 – Terrestrial Ecosystems Existing Conditions Report (AECOM, 2020), under a separate cover. As part of the background review, the Ontario Ministry of Natural Resources and Forestry, Ministry of the Environment, Conservation and Parks, the Lake Simcoe Region Conservation Authority and the Nottawasaga Valley Conservation Authority were consulted to acquire background natural heritage information.

Field investigations were completed in accordance with the Environmental Reference for Highway Design (Ministry of Transportation, 2013) to supplement available background information. The methods of the field investigations completed in Spring/Summer of 2020 and 2021 in order to update the existing terrestrial ecosystems within the Terrestrial Ecosystems Study Area are described below.

Field investigations were completed on the dates outlined in **Table 2-1**.

Table 2-1: Field Investigation Dates

Survey	Year	Dates
Ecological Land Classification and Botanical Inventory Surveys	2020	■ August 24, 26, 31, September 1, and October 21, 22, 29
Ecological Land Classification and Botanical Inventory Surveys	2021	■ August 19, 23, and September 7
Ecological Land Classification and Botanical Inventory Surveys	2022	■ May 5 and 6
Amphibian Night Call Surveys	2021	■ Round 1 – April 10 and 29 ■ Round 2 – May 19 and 26 ■ Round 3 - June 23 and June 24
Breeding Birds Surveys	2021	■ Round 1 - June 7, 9, 10, ■ Round 2 – June 23, 28 and 29

Direct and indirect (e.g., animal tracks) incidental wildlife observations were recorded during all field investigations. Furthermore, Species at Risk or their habitat and Significant Wildlife Habitat features were searched for and recorded during all field investigations.

A habitat assessment was completed for Species at Risk to determine whether there is potential for that Species at Risk to occur within the Terrestrial Ecosystems Study Area. This assessment was based on the characterization of vegetation communities using aerial photograph interpretation and further refined following field investigations. The potential for a species to occur was determined through a probability of occurrence whereby the following rankings were applied:

- **Low Probability:** No suitable habitat present within the Terrestrial Ecosystems Study Area and/or species not identified during targeted surveys and/or no recent occurrence record identified through background review
- **Medium Probability:** Suitable habitat present within the Terrestrial Ecosystems Study Area. Although species not observed during the 2020-2022 field investigations, targeted surveys not performed and there are recent occurrence records within or in the vicinity of the Terrestrial Ecosystems Study Area identified through background review
- **High Probability:** Species and suitable habitat observed within the Terrestrial Ecosystems Study Area during the 2020-2022 field investigations.

Species listed as Special Concern provincially are not afforded protection under the Endangered Species Act but have been included in the Species at Risk screening to avoid future implications should the status of these species change under the Endangered Species Act. Furthermore, habitats of Species of Conservation Concern, which include Special Concern species, are considered Significant Wildlife Habitat under the Provincial Policy Statement, and associated Natural Heritage Reference Manual (MNR, 2010; refer to **Section 2.1.1.3.5**). For this reason, consideration was given to identifying Special Concern species in addition to Threatened and Endangered species.

Ecological Land Classification

Vegetation communities within the Terrestrial Ecosystems Study Area were delineated and classified in accordance with Ecological Land Classification system for southern Ontario (Lee et al., 1998). This protocol uses a series of six nested levels (Site Region, System, Community Class, Community Series, Ecosite and Vegetation Type) to describe the ecological form and function of a vegetation community in a spatial context, from largest to smallest scale.

In advance of field investigations, vegetation communities were delineated based on the interpretation of aerial photographs (i.e., visually assessing contrast and colour changes, canopy density, etc.) and existing data. Field investigations were then completed within each delineated vegetation community, where access was permitted, to classify to the most detailed/lowest level possible (i.e., Vegetation Type or Ecosite) based on plant and substrate compositions. If an area was identified within the Terrestrial Ecosystems Study Area during the field investigations that was not previously delineated but represented a significant area of variation (i.e., at least 0.5 hectare in size), a new community was delineated and classified in the field. Vascular plant species lists were compiled for each vegetation community within the proposed Ministry right-of-way where access was permitted. Where access was not permitted, all species visible from the right-of-way/edge of the community were recorded.

Amphibian Night Call Surveys

Before amphibian night call surveys, candidate significant breeding habitat was identified through both interpretation of aerial imagery and the Significant Wildlife Habitat assessments conducted during Ecological Land Classification surveys. The twelve survey station locations were selected based on the presence of potential habitat for breeding amphibians, as confirmed through daytime site visits conducted on the dates outlined in **Table 2-1**.

Amphibian night call surveys followed the protocol as outlined under the Marsh Monitoring Program (MMP; BSC, 2009). Surveys were completed on three separate

occasions (at least 15 days apart) as outlined in **Table 2-1**. The sequence of the surveys was based on a combination of seasonal timing and appropriate weather conditions. Site visits coincided with a minimum nighttime air temperature of 5 degrees Celsius for the first survey, 10 degrees Celsius for the second survey, and 17 degrees Celsius for the third survey. Surveys were conducted in the evening when there was little wind (Beaufort scale of 3 or less).

At each station, the observer stopped and listened for a minimum of three minutes. The calling frogs were identified by species, and the intensity of the calling activity was recorded using the Marsh Monitoring Program call abundance codes. The frequency categories of calls are described as follows:

- Code 1:** individual calls do not overlap and calling individuals can be discretely counted
- Code 2:** calls of individuals sometimes overlap, but numbers of individuals can still be estimated
- Code 3:** overlap among calls seems continuous (full chorus), and a count estimate is impossible.

The background noise intensity at each monitoring station was also recorded to further characterize sampling conditions on-site and assess habitat quality.

Breeding Birds

Due to Ontario's size and habitat diversity, various bird monitoring protocols are used in the province to target a variety of species in different habitats. For this project, breeding bird surveys were completed following the Ontario Breeding Bird Atlas Guide for Participants (2001) and Forest Monitoring Protocol (Environmental Canada – Canadian Wildlife Service [EC-CWS, 2009]). These surveys were used to determine habitat utilization by birds and the presence of bird Species at Risk and Species of Conservation Concerns within the Terrestrial Ecosystems Study Area.

Twenty breeding bird survey stations were established within the Terrestrial Ecosystems Study Area; each separated by approximately 250 metres. Each station was surveyed twice at least ten days apart in accordance with the survey protocol.

Surveys consisted of 10-minute point counts, which involved recording species, breeding evidence and observations within or beyond a 100-metre radius of the observer. Birds flying over during point counts were recorded as flyovers. Breeding bird surveys were conducted in the morning (i.e., between dawn and five hours after dawn) and during weather conducive to identifying breeding birds (e.g., wind speed of three or less on the Beaufort scale, clear sunny days), whenever possible.

2.1.1.3 Description of Environmental Conditions

2.1.1.3.1 Designated Natural Areas

Natural features and areas identified for protection in the Provincial Policy Statement and other legislation (e.g., Greenbelt Act, 2005) are collectively referred to as 'designated natural areas' in accordance with the Ministry's Environmental Reference for Highway Design. These include, but are not limited to, Areas of Natural and Scientific Interest, significant wetlands, Environmentally Significant/Sensitive Area, etc. and may be identified by the planning authority (e.g., province, municipality, conservation authority).

Comments received from the Ministry of Natural Resources and Forestry on June 17, 2022 indicated that the large, treed swamps and contiguous adjacent upland forest in between the branches of the Holland River likely meet the criteria outlined in the Ministry of Natural Resources and Forestry Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area (2005) to be considered Significant Woodland.

There are a number of designated natural areas within the Terrestrial Ecosystems Study Area, summarized in **Table 2-2** below and illustrated on **Figure 2-1**.

2.1.1.3.2 Vegetation Communities and Plants

A review of the 2002 Approved Environmental Assessment identified ten species that were observed in fen communities present along the Holland River that were considered regionally rare in York Region according to the Vascular Plant Checklist of York County, Ontario (Regional Municipalities of York and Metropolitan Toronto, 1986). These species included:

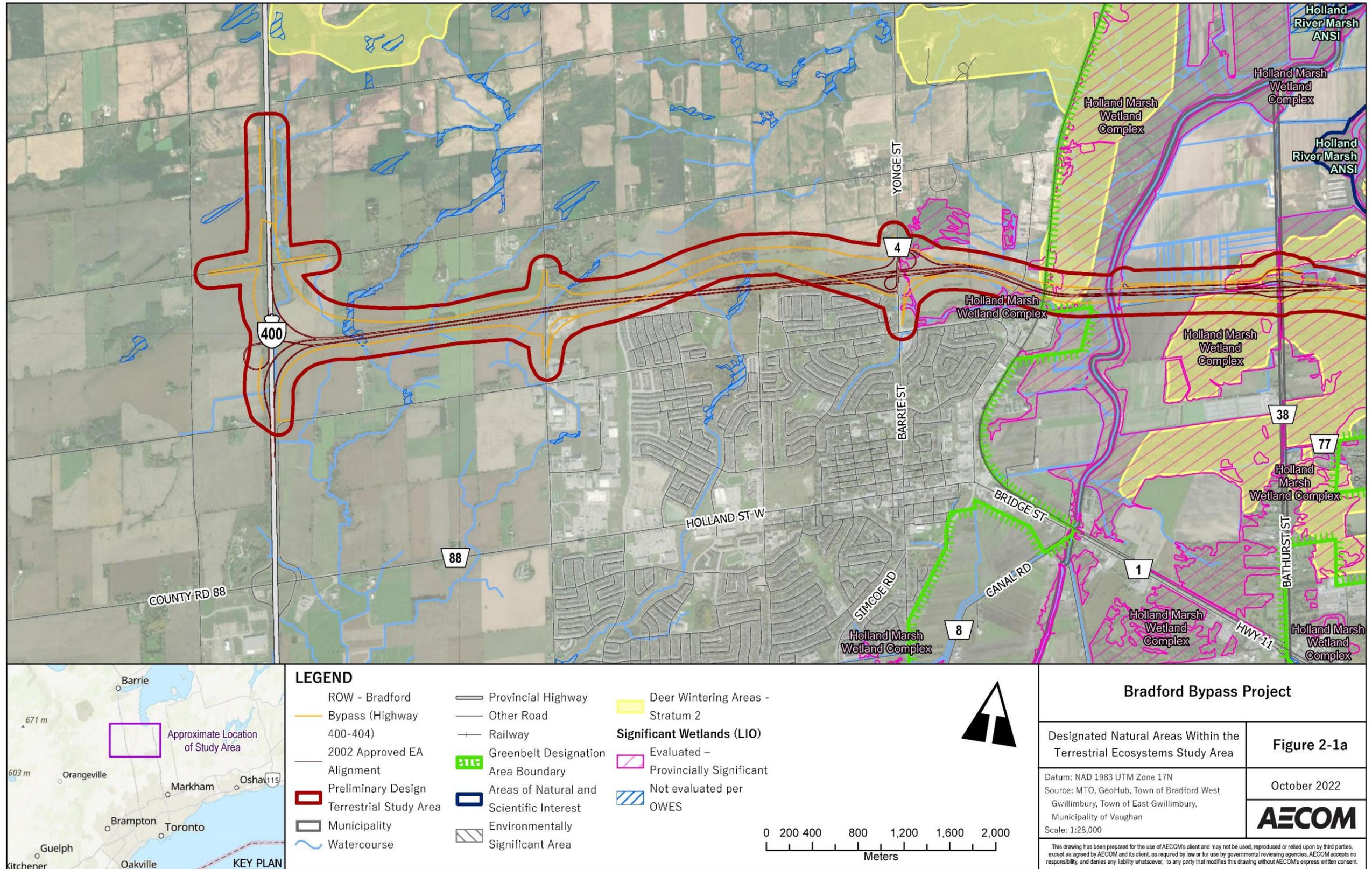
- glaucous-leaved bog rosemary (*Andromeda polifolia* var. *latifolia*)
- marsh bellflower (*Campanula aparinoides*)
- water horsetail (*Equisetum fluviatile*)
- hoary willow (*Salix candida*)
- rush aster (*Symphyotrichum boreale*)
- Buxbaum's sedge (*Carex buxbaumii*)
- Sartwell's sedge (*Carex sartwellii*)
- downy willow-herb (*Epilobium strictum*)
- bog birch (*Betula pumila*)
- marsh muhly (*Muhlenbergia glomerata*).

Table 2-2: Designated Natural Areas Within the Terrestrial Ecosystems Study Area

Feature	Designated Natural Areas	Location Within the Terrestrial Ecosystems Study Area
Environmentally Significant / Sensitive Areas	<ul style="list-style-type: none"> Holland Marsh Environmentally Significant Area (Lake Simcoe Region Conservation Authority) 	<ul style="list-style-type: none"> Encompasses sections of woodland and agricultural land between Yonge Street and 2nd Concession Road.
Wetlands	<ul style="list-style-type: none"> Holland Marsh (BW5) Provincially Significant Wetland 	<ul style="list-style-type: none"> Located west of the Holland River, adjacent to the Holland Marsh Wetland Complex Provincially Significant Wetland.
Wetlands	<ul style="list-style-type: none"> Holland Marsh Wetland Complex Provincially Significant Wetland 	<ul style="list-style-type: none"> Located along the Holland River and Holland River East Branch.
Wetlands	<ul style="list-style-type: none"> Maskinonge River Wetland Complex Provincially Significant Wetland 	<ul style="list-style-type: none"> Located west of Highway 404. The Provincially Significant Wetland is mapped along the banks of the Maskinonge River.
Wetlands	<ul style="list-style-type: none"> Unevaluated Wetlands 	<ul style="list-style-type: none"> Ten unevaluated wetlands are present within the Terrestrial Ecosystems Study Area between Highway 400 and Highway 404 including three large (>5 hectares) unevaluated wetlands present between the Holland River and Holland River East Branch.
Policy Areas	<ul style="list-style-type: none"> Deer Wintering Areas (Ministry of Natural Resources and Forestry) 	<ul style="list-style-type: none"> Stratum 2 Deer Wintering Areas are present within large portions of the wooded areas present between the Holland River and Holland River East Branch and along the east bank of the Holland River East Branch.
Policy Areas	<ul style="list-style-type: none"> Greenbelt Plan – Protected Countryside 	<ul style="list-style-type: none"> Includes the majority of land between the Holland River to Highway 404 with the exception of some agricultural fields located east and west of 2nd Concession Road and Leslie Street.
Policy Areas	<ul style="list-style-type: none"> Lake Simcoe Region Conservation Authority Natural Heritage System (2018) – Core Features (Note 1) 	<ul style="list-style-type: none"> Natural Heritage System Core and associated 30 metre buffer encompass all forested natural areas in the Terrestrial Ecosystems Study Area. Farmland present between the Holland River and Holland River East Branch, portions of farmland found west of 2nd Concession Road and land east of Highway 404 adjacent to the Maskinonge River have been classified as Targeted Areas for Natural Heritage System Enhancement.
Policy Areas	<ul style="list-style-type: none"> York Region Official Plan (2019) – Regional Greenlands System (Note 1) 	<ul style="list-style-type: none"> Regional Greenlands System present between the Holland River and Holland River East Branch extending east of Yonge Street. Included in wooded area between 2nd Concession Road and along the Maskinonge River.
Policy Areas	<ul style="list-style-type: none"> County of Simcoe Official Plan (2016) – Greenlands (Note 1) 	<ul style="list-style-type: none"> Wooded areas between Highway 404 and Yonge Street.
Policy Areas	<ul style="list-style-type: none"> Town of East Gwillimbury Official Plan – Natural Heritage System - Core Areas and Supporting Areas (Note 1) 	<ul style="list-style-type: none"> Wooded and natural areas present between the Holland River and Highway 404.
Policy Areas	<ul style="list-style-type: none"> Township of King Official Plan – Natural Heritage System (Note 1) 	<ul style="list-style-type: none"> Significant Forest present east of the Holland River.

Note 1: These designated natural areas are not included on **Figure 2-1**

Figure 2-1a: Designated Natural Areas Within the Terrestrial Ecosystems Study Area



Another regionally-rare species, daisy-Leaved Moonwort (*Botrychium matricariifolium*), was observed in the deciduous swamp found directly east of the Holland River East Branch.

Agricultural lands largely represent the Terrestrial Ecosystems Study Area with some industrial, and commercial properties also present. Natural areas are generally limited to remnant woodlands and wetlands persisting in an otherwise agriculturally dominated landscape. Some larger naturalized areas transect the Terrestrial Ecosystems Study Area; these are generally associated with the crossings of the Holland River and the Holland River East Branch, as well as their associated wetlands, which include the BW5, Holland Marsh Wetland Complex, Holland River Marsh, and the Holland Landing Fens & Wetlands.

Field investigations completed in support of the Preliminary Design confirmed that vegetation communities within the Terrestrial Ecosystems Study Area include deciduous, coniferous, and mixed forests (FOD, FOC & FOM), plantations (CUP), cultural woodlands, thickets, and meadows (CUW, CUT, CUM), wetlands and open water communities (MAM, MAS, SAF and OAO) as well as deciduous swamps and swamp thickets (SWD, SWT). As part of the field investigations, 102 polygons represented by 46 different community types were examined. One rare vegetation community was identified within the Terrestrial Ecosystems Study Area during field investigations, Dry-Fesh Hickory Deciduous Forest (FOD2-3).

Comments received from the Ministry of Natural Resources and Forestry on June 17, 2022 indicated that the treed swamps and contiguous adjacent upland forest in between the branches of the Holland River likely meet the criteria outlined in the Ministry of Natural Resources and Forestry Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area (2005) to be considered Significant Woodland. Following the guidelines for Significant Woodlands it is likely that the majority of forest, woodland and swamp communities intersected by the proposed Ministry right-of-way meet one of the criteria for Significant Woodland based on area requirements and/or these communities being considered candidate habitat for Species at Risk (**Section 2.1.1.3.4**).

Vegetation communities present along existing roadways within the Ministry right-of-way, which has resulted from or has been maintained by anthropogenic disturbances (i.e., seed mixes and plantings as part of restoration activities and/or continued maintenance or mowing), were largely delineated and classified as Mineral Cultural Meadow (CUM1) or Dry-Moist Old Field Cultural Meadow (CUM1-1) given limited natural vegetation communities present within the Terrestrial Ecosystems Study Areas.

The locations of Ecological Land Classification communities are shown **Figure 2-2**.

Two Species at Risk were recorded within the Terrestrial Ecosystems Study Area; butternut (*Juglans cinerea*) and black ash (*Fraxinus nigra*) and are both listed as Endangered under the Endangered Species Act. **Table 2-3** provides details of the butternut and black ash found during field investigations. Black ash individuals and their habitat are technically afforded protection under the Endangered Species Act; however, the protection of the species is temporarily suspended for two years until 2024 to allow the Ministry of the Environment, Conservation and Parks to determine the best way to protect and recover black ash in the province of Ontario. During this time, activities that impact black ash and its habitat may proceed without authorization under the Endangered Species Act.

Figure 2-2a: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

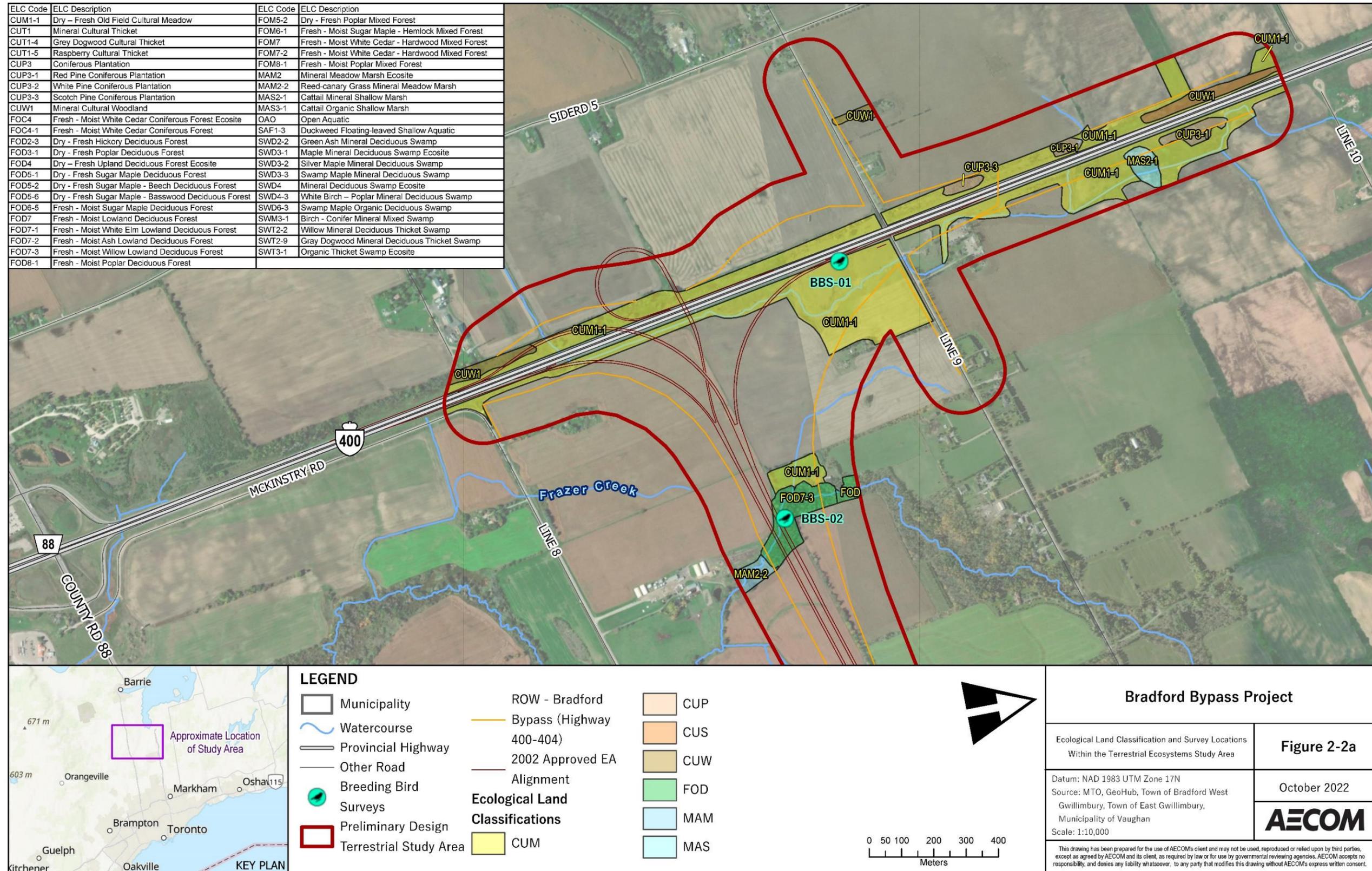


Figure 2-2b: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

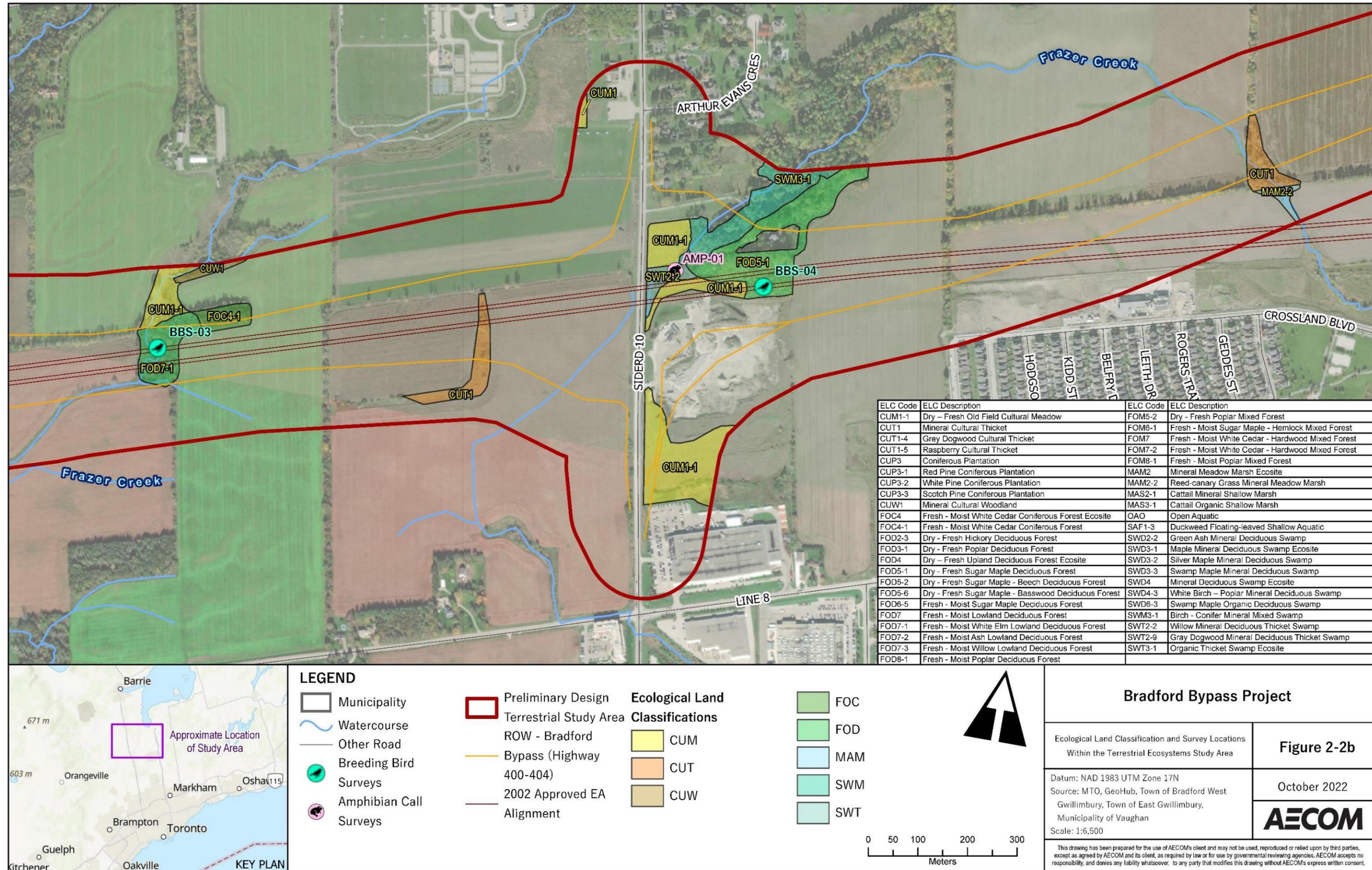


Figure 2-2c: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

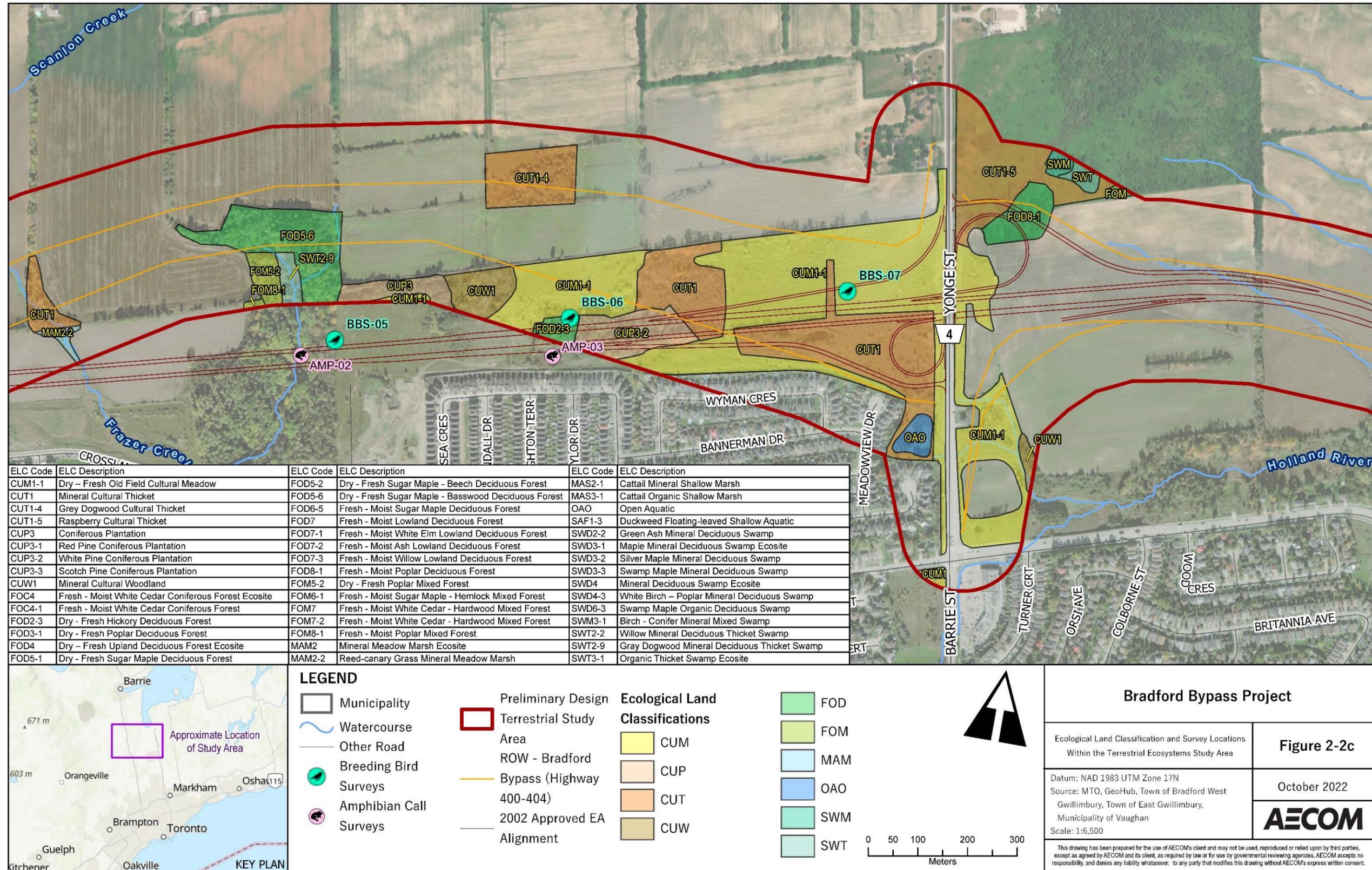


Figure 2-2d: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

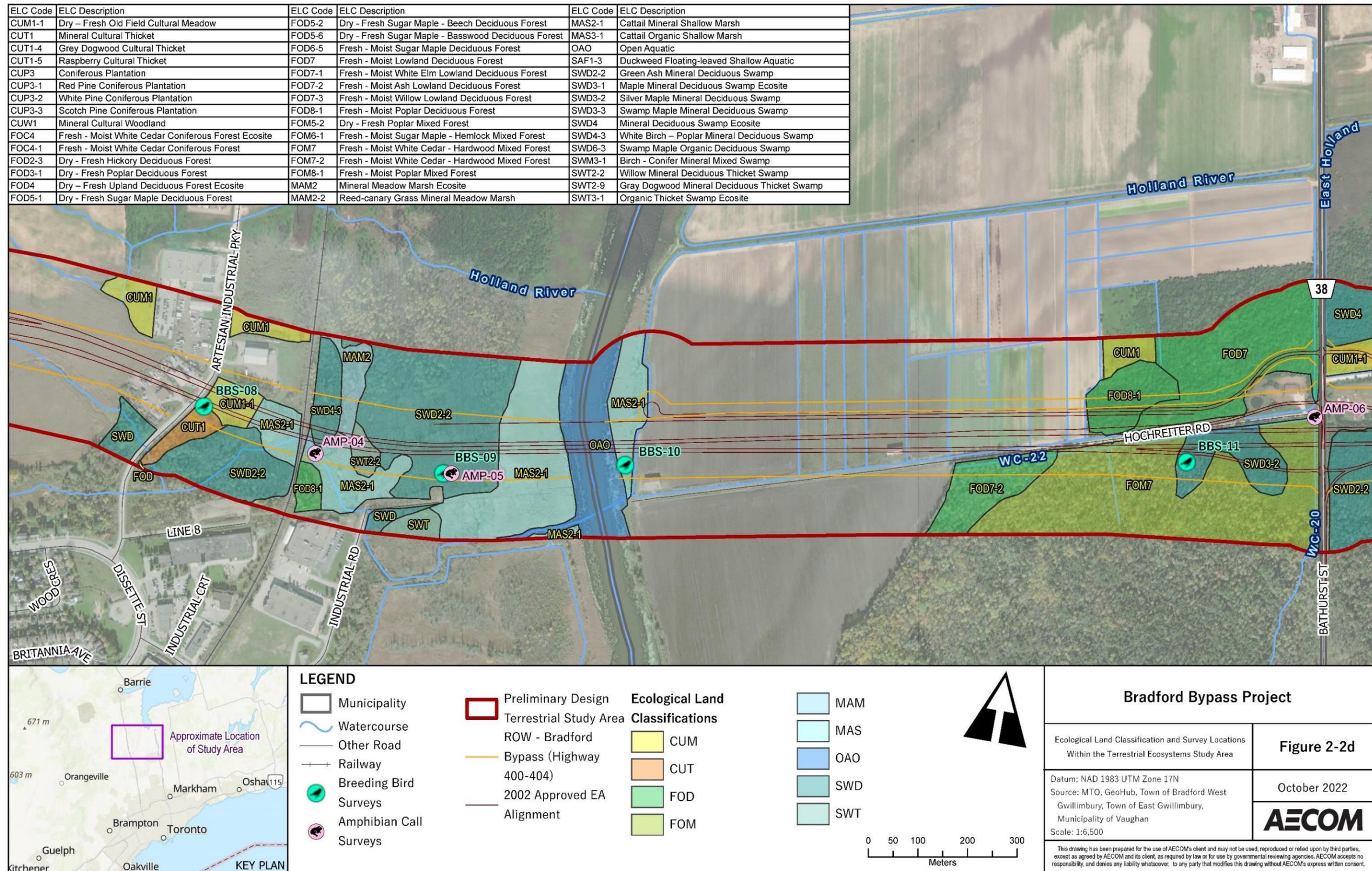


Figure 2-2e: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

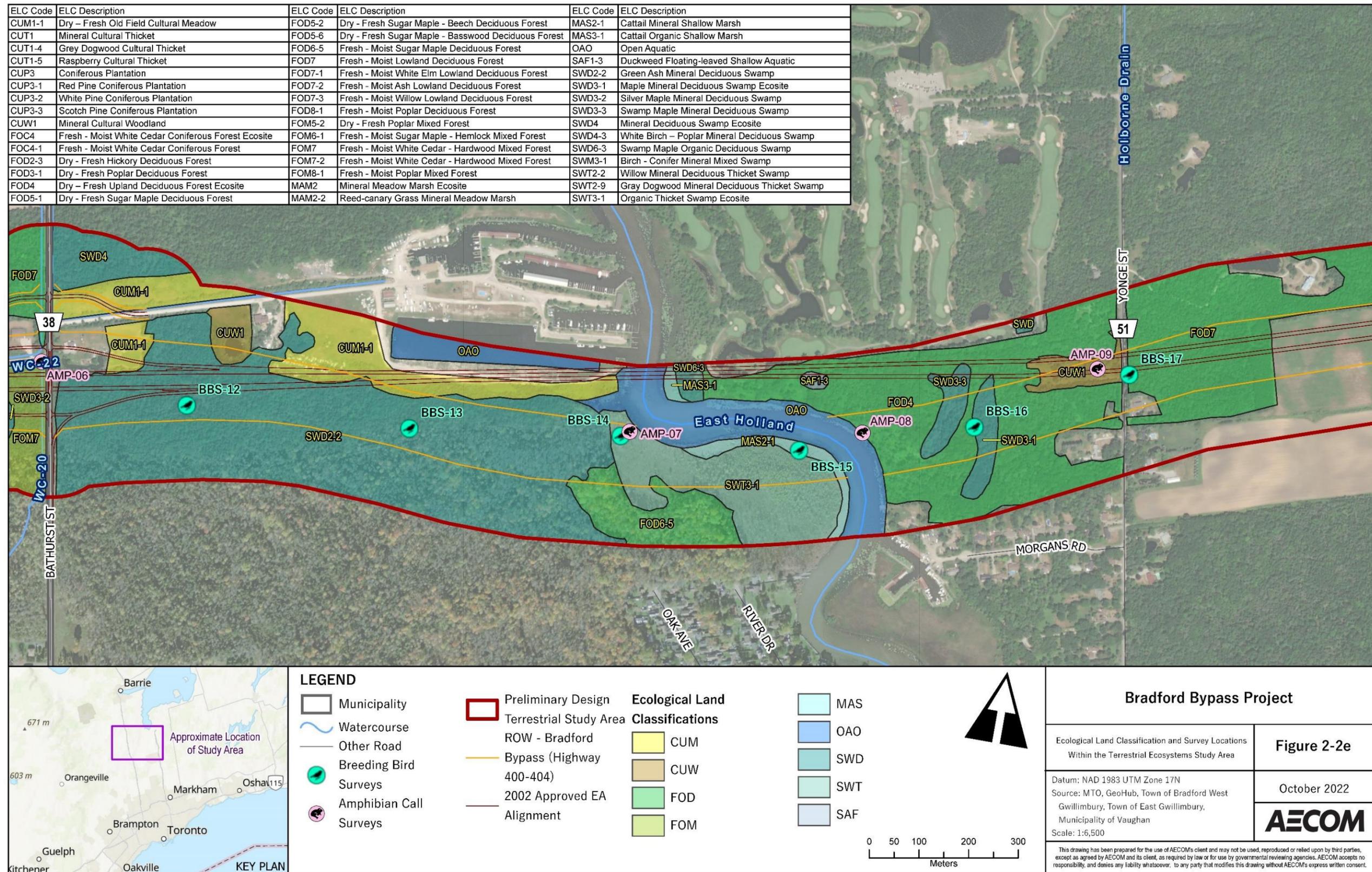


Figure 2-2f: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

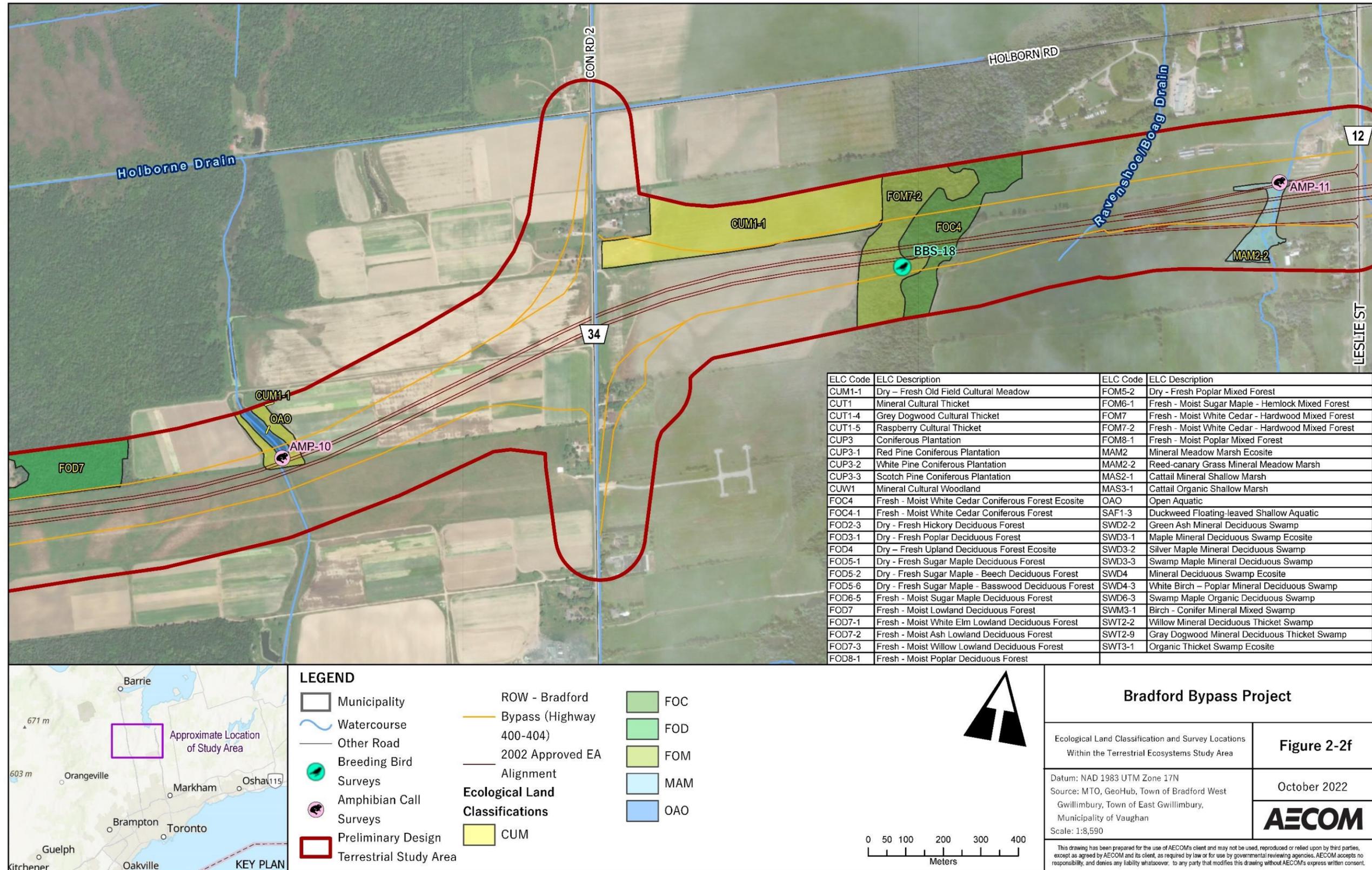


Figure 2-2g: Ecological Land Classification and Survey Locations Within the Terrestrial Ecosystems Study Area

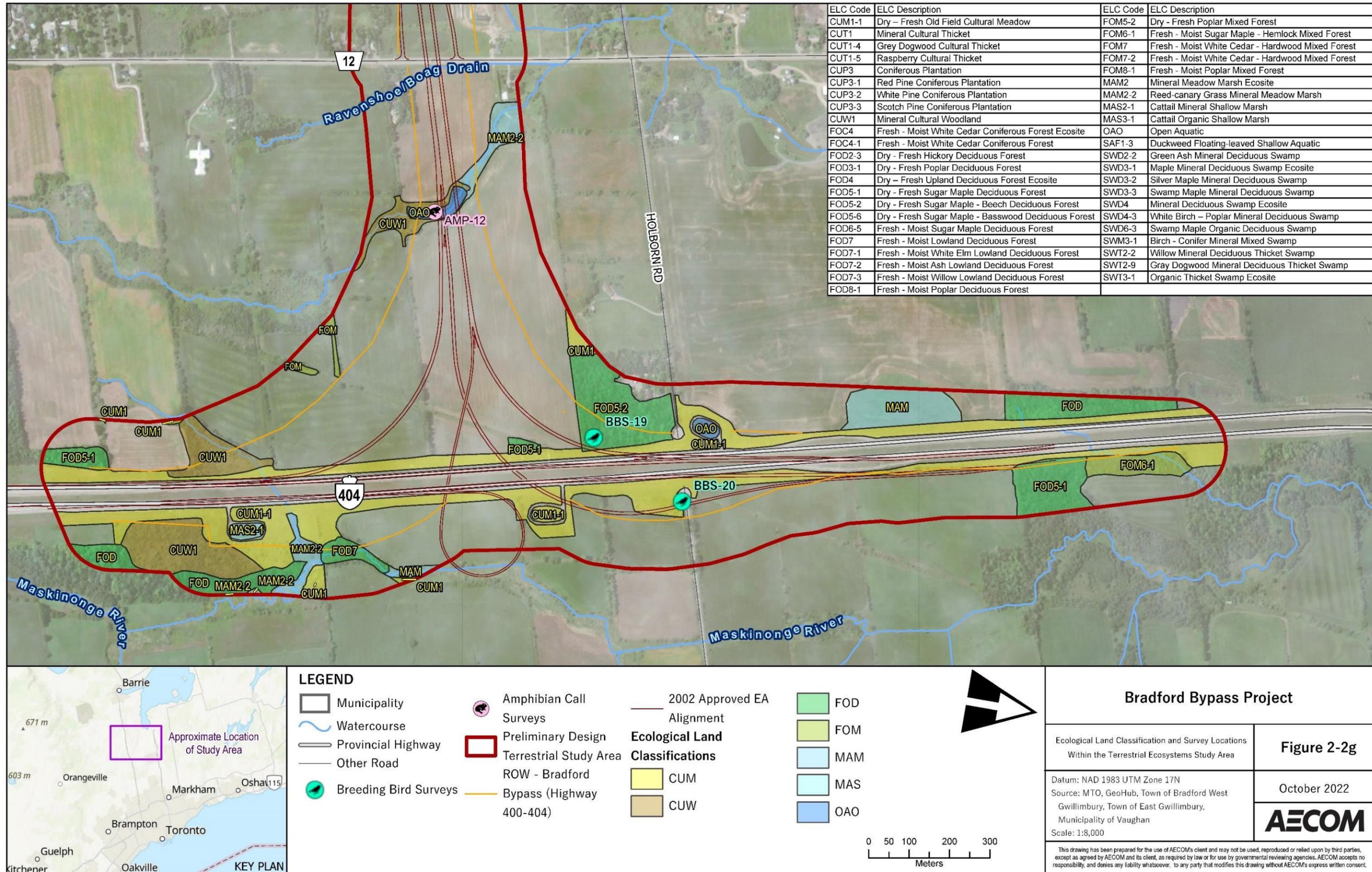


Table 2-3: Records of Butternut and Black Ash Within the Terrestrial Ecosystems Study Area

Species	Ecological Land Classification Community	Community ID	Details
Butternut	<ul style="list-style-type: none"> ■ FOD2-3 ■ Dry – Fresh Hickory Deciduous Forest Type 	ELC-046	<ul style="list-style-type: none"> ■ Three butternut trees were found in this community. The community is located in a naturalized area approximately 450 metres west of crossing of Yonge Street.
Butternut	<ul style="list-style-type: none"> ■ CUP3-2 ■ White Pine Coniferous Plantation Type 	ELC-046a	<ul style="list-style-type: none"> ■ Three butternut trees were found in this community. The community is located in a naturalized area approximately 450 metres west of crossing of Yonge Street.
Butternut	<ul style="list-style-type: none"> ■ CUT1 ■ Mineral Cultural Thicket Ecosite 	ELC-047	<ul style="list-style-type: none"> ■ Fifteen butternut trees were found in this community. The community is located in a naturalized area approximately 450 metres west of crossing of Yonge Street.
Butternut	<ul style="list-style-type: none"> ■ CUW1-1 ■ Red Cedar Cultural Woodland Type 	ELC-192	<ul style="list-style-type: none"> ■ Eight butternut trees were found in this community. The community is located in a naturalized area approximately 450 metres west of crossing of Yonge Street.
Black Ash	<ul style="list-style-type: none"> ■ FOM7 ■ Fresh – Moist Lowland Deciduous Forest Ecosite 	ELC-098	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.
Black Ash	<ul style="list-style-type: none"> ■ SWT3-1 ■ Alder Organic thicket Swamp Type 	ELC-120	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.
Black Ash	<ul style="list-style-type: none"> ■ SWD3-1 ■ Red Maple Mineral Deciduous Swamp Type 	ELC-142	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.
Black Ash	<ul style="list-style-type: none"> ■ SWD3-1 ■ Red Maple Mineral Deciduous Swamp Type 	ELC-142a	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.
Black Ash	<ul style="list-style-type: none"> ■ FOD3-1 ■ Dry – Fresh Poplar Deciduous Forest Type 	ELC-154	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.
Black Ash	<ul style="list-style-type: none"> ■ FOD6 ■ Fresh – Moist Sugar Maple Deciduous Forest Ecosite 	ELC-154a	<ul style="list-style-type: none"> ■ Located within the forested areas adjacent to the Holland River, north of the Yonge Street and Morgans Road intersection.

No Species of Conservation Concern plants were observed within the Terrestrial Ecosystems Study Area. For the 320 plant species recorded; 234 (73.12%) of which were identified as native and the remaining 74 (23.13%) were identified as non-native. Species at Risk and Species of Conservation Concern plants identified through the field investigations are further discussed in **Section 2.1.1.3.4** and **Section 2.1.1.3.5**. Hazardous plants identified within the Terrestrial Ecosystems Study Area included multiple occurrences of poison ivy (*Toxicodendron radicans*), wild parsnip (*Pastinaca sativa*), water-hemlock (*Cicuta virosa*), spotted water-hemlock (*Cicuta maculate*) and western poison ivy (*Toxicodendron radicans* var. *rydbergii*) throughout the Terrestrial Ecosystems Study Area including within the right-of-way.

2.1.1.3.3 Wildlife

Breeding bird surveys completed as part of the 2002 Approved Environmental Assessment report identified two species considered provincially and nationally vulnerable at the time of the study, Louisiana Waterthrush (*Parkesia motacilla*) and Red-Shouldered Hawk (*Buteo lineatus*). Since the 2002 Approved Environmental Assessment report, the federal and provincial statuses of Louisiana Waterthrush and Red-Shouldered Hawk have been reassessed. The Louisiana Waterthrush was designated as Threatened both federally and provincially in 2015 and 2016, respectively (Committee on the Status of Species at Risk in Ontario, 2016). The Red-Shouldered Hawk was determined to no longer be at risk federally or provincially in 2006 (Committee on the Status of Endangered Wildlife in Canada, 2006). The updated background information review identified records of 139 bird species potentially present within the Terrestrial Ecosystems Study Area, which included six that are listed as Threatened and eight that are listed as Special Concern under the Endangered Species Act. These species are further discussed in **Section 2.1.1.3.4** and **Section 2.1.1.3.5**.

Herpetofauna surveys completed as part of the 2002 Approved Environmental Assessment report identified the presence of seven amphibian species and three reptiles. Of these, two Species of Conservation Concern were identified, which included: Snapping turtle (*Chelydra serpentina*) and western chorus frog (*Pseudacris triseriata*). The updated background information review identified records for 23 reptile and amphibian species. Of these, one is listed as Endangered; one is listed Threatened and another three species are considered Species of Conservation Concern. Species at Risk and Species of Conservation Concern records in the vicinity of the Terrestrial Ecosystems Study Area identified through the field investigations are further discussed in **Section 2.1.1.3.4** and **Section 2.1.1.3.5**, respectively.

Eighteen incidental mammal observations were recorded as part of the 2002 Approved Environmental Assessment. Of these, one unconfirmed bat species, which was noted to

likely be little brown myotis (*Myotis lucifugus*), was observed during field investigations. This presumed species is now listed as Endangered under the Endangered Species Act. The updated background information review identified records for 48 mammal species. Most of these species are common, tolerant to disturbance and have secure populations in Ontario except four species listed as Endangered and protected under the Endangered Species Act; these Species at Risk are discussed further in **Section 2.1.1.3.4**.

The updated background information review also identified records of 33 butterfly species; all of these species are common and have secure populations in Ontario with the exception of monarch (*Danaus plexippus*), which is listed as Special Concern under the Endangered Species Act and is therefore treated as Species of Conservation Concern. Species of Conservation Concern is further discussed in **Section 2.1.1.3.5**.

Amphibian Night Call Surveys

Potential amphibian breeding habitat locations within the Terrestrial Ecosystems Study Area were identified based on aerial photo interpretation and Significant Wildlife Habitat assessment. Twelve locations were confirmed to be potentially suitable by containing either permanent or seasonal standing water. Therefore, amphibian night call surveys were performed at 12 monitoring stations. The results of these surveys are summarized in **Table 2-4**.

Amphibians were recorded calling at the majority of the stations during at least one round of surveys. AMP-12 and AMP-13 were the only stations where staff did not observe frogs calling. The first two rounds of surveys at AMP-13 could not be completed due to accessibility limitations. Although, no frogs were heard at AMP-13 during the third round of surveys, a conservative approach that assumes amphibian breeding habitat has been adopted.

Six amphibian species were heard calling during surveys, these include the following: American toad (*Anaxyrus americanus*), gray treefrog (*Hyla versicolor*), green frog (*Lithobates clamitans*), spring peeper (*Pseudacris crucifer*), northern leopard frog (*Lithobates pipiens*) and wood frog (*Lithobates sylvaticus*). While some stations contained a large number of individuals calling, no stations met the criteria of significant Amphibian Breeding Habitat as defined in the Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E (MNR, 2015).

Table 2-4: Summary of Amphibian Survey Conditions and Results

Monitoring Round and Station ID	Date	Time	Beaufort Wind Scale	Cloud Cover (%)	Background Noise	Air Temperature (°C)	Precipitation	Results
AMP-1.1	04/10/2021	22:27 – 22:30	1	100	2-3	18	none	■ Choruses of American toad and spring peeper, two wood frogs also heard calling.
AMP-1.2	05/19/2021	23:35 – 23:38	1	50	2	18	none	■ Two spring peepers heard calling. One spring peeper and one American toad heard calling outside the Terrestrial Ecosystems Study Area.
AMP-1.3	06/24/2021	21:50 – 21:53	1	95	4	24	none	■ Two gray treefrogs heard calling.
AMP-2.1	04/10/2021	20:35 – 20:38	1	100	1	18	none	■ Choruses of American toad and spring peeper heard calling.
AMP-2.2	05/19/2021	21:25 – 21:28	1	80	1	22	none	■ Two spring peepers heard calling.
AMP-2.3	06/24/2021	21:32 – 21:35	1	95	0-1	24	none	■ No frogs heard calling.
AMP-3.1	04/10/2021	20:27 – 20:31	1	100	2-3	18	none	■ Chorus of spring peeper heard calling
AMP-3.2	05/19/2021	21:25 – 21:28	1	80	1	22	none	■ One gray treefrog and a chorus of spring peeper heard calling.
AMP-3.3	06/24/2021	21:21 – 21:24	1	95	0	24	none	■ One gray treefrog heard calling.
AMP-4.1	04/10/2021	21:12 – 21:15	1	100	1	18	none	■ One spring peeper and three northern leopard frogs heard calling.
AMP-4.2	05/19/2021	22:16 – 22:19	0-1	60	2	19	none	■ No frogs heard calling within the Terrestrial Ecosystems Study Area. One American toad and one gray treefrog were heard outside of the Terrestrial Ecosystems Study Area
AMP-4.3	06/24/2021	22:13 – 20:16	0-1	95	1	23	none	■ No frogs heard calling.
AMP-5.1	04/10/2021	22:27 – 22:30	1	100	2-3	18	none	■ A chorus of spring peeper, one northern leopard frog and one American toad head calling.
AMP-5.2	05/19/2021	22:16 – 22:19	0-1	60	2	19	none	■ No frogs heard calling within the Terrestrial Ecosystems Study Area. It was noted that green frogs, spring peepers and American toads were calling away from the station south of the road in a shallow marsh.
AMP-5.3	06/24/2021	22:07 – 20:10	0-1	95	1	23	none	■ No frogs heard calling. It was noted that green frogs were seen on the trail.
AMP-6.1	04/10/2021	21:46 – 21:49	0	100	1	18	none	■ One spring peeper, one northern leopard frog and two wood frogs heard calling
AMP-6.2	05/19/2021	22:44 – 22:47	0-1	60	2	19	none	■ No frogs heard calling within the Terrestrial Ecosystems Study Area. A chorus of gray treefrogs and one green frog were heard outside of the Terrestrial Ecosystems Study Area.
AMP-6.3	06/23/2021	22:44 – 22:47	1	5	0-1	17	none	■ No frogs heard calling.
AMP-7.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	■ Station was inaccessible due to health and safety reasons.
AMP-7.2	05/26/2021	21:15 – 21:18	2-3	10	0	15	none	■ Two gray treefrogs were heard calling.
AMP-7.3	06/23/2021	22:20 – 22:23	2	5	1	18	none	■ One green frog and one gray treefrog heard calling.
AMP-8.1	04/29/2021	20:30 – 20:33	0	100	0	8	none	■ Chorus of spring peeper heard calling.
AMP-8.2	05/26/2021	22:24 – 22:27	2-3	10	0	14	none	■ No frogs heard calling.
AMP-8.3	06/23/2021	21:15 – 21:18	2	5	0	18	none	■ No frogs heard calling.

Monitoring Round and Station ID	Date	Time	Beaufort Wind Scale	Cloud Cover (%)	Background Noise	Air Temperature (°C)	Precipitation	Results
AMP-9.1	04/10/2021	22:00 – 22:05	0	100	1	18	none	■ Chorus of American toad, one wood frog. As well a chorus of spring peeper was heard calling outside of the Terrestrial Ecosystems Study Area.
AMP-9.2	05/19/2021	23:06 – 23:09	0-1	50	2	18	none	■ One spring peeper heard calling. A chorus of American toads and one spring peeper recorded calling outside of Terrestrial Ecosystems Study Area.
AMP-9.3	06/23/2021	21:38 – 21:41	2	5	0	18	none	■ No frogs heard calling.
AMP-10.1	04/29/2021	21:50 – 21:53	0	100	0	8	drizzle	■ No frogs heard calling within 100 metres. American toad and spring peeper were heard outside of the Terrestrial Ecosystems Study Area.
AMP-10.2	05/26/2021	23:44 – 23:47	3	10-20	0	12	none	■ One green frog heard calling.
AMP-10.3	06/23/2021	23:05 – 23:08	2	5	1	18	none	■ No frogs heard calling within the Terrestrial Ecosystems Study Area. One green frog heard outside of the Terrestrial Ecosystems Study Area.
AMP-11.1	04/29/2021	21:19 – 21:22	0	100	1	9	drizzle	■ No frogs heard calling.
AMP-11.2	05/26/2021	00:10 – 00:13	3	10-20	2	11	none	■ No frogs heard calling.
AMP-11.3	06/23/2021	23:28 – 23:31	2	5	2	18	none	■ No frogs heard calling.
AMP-12.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	■ Permission to Enter not granted
AMP-12.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	■ Permission to Enter not granted
AMP-12.3	06/23/2021	23:36 – 23:39	2	5	2-3	18	none	■ No frogs heard calling.

Notes: Background noise is indicated using the following background noise codes reproduced from the Marsh Monitoring Program Participants Handbook (BSC, 2008):

- 0 – No appreciable effect (e.g., owl calling)
- 1 – Slightly affecting sampling (e.g., distant traffic, dog barking, car passing)
- 2 – Moderately affecting sampling (e.g., distant traffic, 2 to 5 cars passing)
- 3 – Seriously affecting sampling (e.g., continuous traffic nearby, 6 to 10 cars passing)
- 4 – Profoundly affecting samplings (e.g., continuous traffic passing, construction noise)

Breeding Birds

Breeding bird surveys were conducted in various habitats representative of the Terrestrial Ecosystems Study Area, including forest, woodland, thicket, meadow, and marsh. While habitat is concentrated along riparian corridors, migratory birds may also nest within the Ministry right-of-way where trees, shrubs or dense ground vegetation cover exist. Survey conditions are outlined in **Table 2-5**.

Table 2-5: Breeding Bird Survey Conditions

Round	Point Count Station ID	Date	Start Time/ End Time	Temperature (Low-High; °C)	Wind (Min-Max; Beaufort Scale)	Cloud Cover (Min-Max; %)	Precipitation
1	BBS-01, 04-09	June 7, 2021	5:46 to 9:25	23-25	0-1	15-100	None
1	BBS-10-17	June 9, 2021	6:16 to 9:55	20	0	50	None
1	BBS-02,03,18-20	June 10, 2021	6:13 to 9:51	18	0-1	0	None
2	BBS-01-07	June 23, 2021	6:08 to 9:12	8-14	1	0-15	None
2	BBS-08-16	June 28, 2021	5:58 to 9:58	23-25	0-2	10-45	None
2	BBS-17-20	June 29, 2021	6:22 to 7:54	22-24	0-1	50-100	None

Fifty-five species were observed over two rounds of point count surveys and incidentally during other field investigations within the Terrestrial Ecosystems Study Area. This includes the following migratory birds listed as Threatened under the Endangered Species Act and/or Schedule 1 of the Species at Risk Act: Eastern meadowlark (*Sturnella magna*) and barn swallow (*Hirundo rustica*). Additionally, bobolink (*Dolichonyx oryzivorus*) was observed in Ecological Land Classification polygon ELC-167a while walking to station BBS-18 during the first round of surveys. However, during the second round it was observed that the field had been mowed and no bobolink were noted to occur.

Eastern meadowlarks were observed within the meadow southeast of Highway 400 and 9th Line (station BBS-01) during both rounds of point count surveys. The first survey on June 2, 2021, identified one adult exhibiting nesting behaviour as it was noted to be carrying food. The second survey conducted on June 23, 2021, identified a pair of eastern meadowlarks exhibiting nesting behaviour as one individual was noted to be singing and produced an alarm call. This behaviour indicates the individual had established territory and was nesting within the meadow.

Barn swallows were identified foraging over the Holland River at station BBS-10 on Hochreiter Road. They were observed during the second point count survey at this

station on June 28, 2021. The barn swallows observed were likely nesting nearby. Barn swallows' nest in human-made structures such as barns and culverts that occur within the Terrestrial Ecosystems Study Area however, no nests were found within the Terrestrial Ecosystems Study Area during field investigations.

The following Species of Conservation Concern species were also observed: Eastern wood-pewee (*Contopus virens*), and wood thrush (*Hylocicla mustelina*). The habitats of these Species of Conservation Concern are considered Significant Wildlife Habitat and are discussed further in **Section 2.1.1.3.5**.

Incidental Wildlife Observations

During field investigations, any evidence (e.g., observation, scat, tracks, calls, etc.) of wildlife and their associated habitat and habitat usages were documented. Five mammals, nineteen birds, five insects, two amphibians and two reptiles were observed. Of these two Species of Conservation Concern were recorded. The remaining species are designated as Secure or Apparently Secure in Ontario. AECOM Ecologists observed midland painted turtles (*Chrysemys picta marginate*) within Ecological Land Classification community ID-125 (OAO). While midland painted turtles are not considered Species at Risk or Species of Conservation Concern in Ontario, this species is designated as Special Concern federally by Species at Risk Act. While midland painted turtles do not receive habitat protection, individuals are protected under the Fish and Wildlife Conservation Act (1997).

2.1.1.3.4 Species at Risk

The 2002 Approved Environmental Assessment defined Species at Risk as those species identified by the Committee on the Status of Endangered Wildlife in Canada as vulnerable, threatened, or endangered. At the time of the report, no species listed by Committee on the Status of Endangered Wildlife in Canada were observed within the Study Area. The current Endangered Species Act was enacted in 2007. This legislation provides individual and habitat protection to those species designated as either Endangered or Threatened on the Species at Risk in Ontario List. Currently in Ontario there are over 200 Species at Risk.

The updated background review documented in the Highway 400 – Highway 404 Link (Bradford Bypass W.O. #19-2001 – Terrestrial Ecosystems Existing Conditions Report (AECOM, 2020) identified the potential for 16 Species at Risk within the vicinity of the Terrestrial Ecosystems Study Area. It is noted that two additional species potentially occurring within the Terrestrial Ecosystems Study Area, were reassessed by Committee on the Status of Species at Risk in Ontario with black ash and red-headed Woodpecker (*Melanerpes erythrocephalus*) being reassessed as Endangered in Ontario (previously

considered not at risk). The new designations for both species were amended in Ontario Regulation 230/08 under the Endangered Species Act on January 26, 2022.

Additionally, since the updated background review was completed, Ontario Reptile and Amphibian Atlas records were refined, and background records of Jefferson/blue-spotted salamander hybrid (*Ambystoma jeffersonianum* / laterale hybrid) were removed in the vicinity of the Terrestrial Ecosystems Study Area. As such, 17 Species at Risk were noted to potentially occur within the Terrestrial Ecosystems Study Area. Of these Species at Risk records, eight are species listed as Endangered and nine are species listed as Threatened. These records of potential Species at Risk are listed in **Table 2-6**.

Through more recent review including surveys completed in 2021, 13 Species at Risk (Threatened or Endangered) were determined to have high or medium potential to occur within the Terrestrial Ecosystems Study Area based on the presence of suitable habitat. A table summarizing these species and the locations of their respective potential habitats is provided in **Table 2-7** below. Confirmed habitat is mapped on **Figure 2-3**.

As described in **Section 2.1.1.3.4** and **Section 2.1.1.3.5**, five Species at Risk were recorded during field investigations conducted during 2020-2022 investigations, including: bobolink, black ash, butternut, eastern meadowlark and barn swallow. Both black ash and butternut were confirmed within the Terrestrial Ecosystems Study Area. Confirmed breeding habitat for eastern meadowlark was identified within the meadow at BBS-01, where a pair were identified to be nesting. Barn swallows were observed within the Terrestrial Ecosystems Study Area; however, breeding evidence was not noted. While barn swallows were observed foraging within the Terrestrial Ecosystems Study Area, no nests were identified in any of the examined structures. It is likely barn swallows had been nesting on structures located outside, but in proximity to the Terrestrial Ecosystems Study Area. There is potential for barn swallow to nest within the Terrestrial Ecosystems Study Area during future breeding seasons due to the presence of suitable nesting structures (i.e., bridges, culverts). Bobolink was observed in the cultural meadow community (ELC-167a) present in the vicinity of breeding bird station 18 (BBS-18) during the first round of breeding bird surveys. However, no breeding evidence was observed, and the feature was found to be mowed during the second round of surveys.

Table 2-6: Species at Risk Records Within the Terrestrial Ecosystems Study Area

Taxa	Common Name	Scientific Name	S-Rank ¹	Endangered Species Act Status ²	Species at Risk Act Status ³	Source of Record	Date from Background Sources
Bird	Bank swallow	<i>Riparia riparia</i>	Apparently Secure Breeding	Threatened	Threatened	Ministry of the Environment, Conservation and Parks, Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2013
Bird	Barn swallow	<i>Hirundo rustica</i>	Apparently Secure Breeding	Threatened	Threatened	Ministry of the Environment, Conservation and Parks, Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2017
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	Apparently Secure Breeding	Threatened	Threatened	Ministry of the Environment, Conservation and Parks, Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2002
Bird	Chimney swift	<i>Chaetura pelagica</i>	Apparently Secure Breeding, Apparently Secure Non-breeding	Threatened	Threatened	Ontario Breeding Bird Atlas	2001-2005
Bird	Eastern meadowlark	<i>Sturnella Magna</i>	Apparently Secure Breeding	Threatened	Threatened	Ministry of the Environment, Conservation and Parks, Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2001
Bird	Eastern whip-poor-will	<i>Antrostomus vociferus</i>	Apparently Secure Breeding	Threatened	Threatened	Ontario Breeding Bird Atlas	2001-2005
Bird	Henslow's sparrow	<i>Ammodramus henslowii</i>	Historic Breeding	Endangered	Endangered	Ministry of the Environment, Conservation and Parks	N/A
Bird	Least bittern	<i>Ixobrychus exilis</i>	Apparently Secure Breeding	Threatened	Threatened	Ministry of the Environment, Conservation and Parks, Natural Heritage Information Centre	1997
Bird	Louisiana waterthrush	<i>Parkesia motacilla</i>	Vulnerable Breeding	Threatened	Threatened	2002 Approved Environmental Assessment	1995
Bird	Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Apparently Secure Breeding	Endangered	Threatened	Ministry of the Environment, Conservation and Parks	N/A
Mammal	Eastern small-footed myotis	<i>Myotis leibii</i>	Imperilled Vulnerable	Endangered	No Status	Bat Conservation International	N/A
Mammal	Little brown myotis	<i>Myotis lucifugus</i>	Apparently Secure	Endangered	Endangered	Ministry of the Environment, Conservation and Parks, Bat Conservation International	N/A
Mammal	Northern myotis	<i>Myotis septentrionalis</i>	Vulnerable	Endangered	Endangered	Ministry of the Environment, Conservation and Parks, Bat Conservation International	N/A
Mammal	Tri-colored bat	<i>Perimyotis subflavus</i>	Vulnerable	Endangered	Endangered	Ministry of the Environment, Conservation and Parks, Bat Conservation International	N/A
Plant	Black ash	<i>Fraxinus nigra</i>	Vulnerable	Endangered	Threatened	Ministry of the Environment, Conservation and Parks	N/A
Plant	Butternut	<i>Juglans cinerea</i>	Imperilled	Endangered	Endangered	Ministry of the Environment, Conservation and Parks, 2002 Approved Environmental Assessment, Natural Heritage Information Centre	1997
Reptile	Blanding's turtle	<i>Emydoidea blandingii</i>	Vulnerable	Threatened	Threatened	Ontario Reptile Amphibian Atlas	2017

Notes: 1. S2 – Imperilled, S3 – Vulnerable, S4 – Apparently Secure, SH – Historic, S#B/S#N – Breeding/Non-breeding
 2. THR – Threatened, END – Endangered

Table 2-7: Species at Risk Identified with High or Medium Potential to Occur Within the Terrestrial Ecosystems Study Area

Taxa	Common Name	Scientific Name	Endangered Species Act Status	Species at Risk Act Status	Probability of Occurrence	Confirmed or Candidate Habitat
Bird	Barn swallow	<i>Hirundo rustica</i>	THR	THR	High	Candidate Individuals were observed foraging within the Terrestrial Ecosystems Study Area but no nests were found. Suitable nesting habitat (barns and culverts) was present and may be used in the future.
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	High	Confirmed Individuals were observed within the Terrestrial Ecosystems Study Area (ELC-167a) but no nests were found. Habitat where species was observed was found to be mowed during field investigations. Agricultural fields present within the Terrestrial Ecosystems Study Area may provide future opportunities for nesting depending on the crops planted in a given year.
Bird	Chimney swift	<i>Chaetura pelagica</i>	THR	THR	Medium	Candidate Buildings with potentially suitable chimneys for nesting and roosting may be present within the Terrestrial Ecosystems Study Area. Foraging habitat in the form of cultural meadows, marshes and open or shallow water are also present within the Terrestrial Ecosystems Study Area.
Bird	Eastern meadowlark	<i>Sturnella magna</i>	THR	THR	High	Confirmed Confirmed breeding habitat was identified during field investigations (ELC-007).
Bird	Eastern whip-poor-will	<i>Antrostomus vociferus</i>	S4B	THR	Medium	Candidate Suitable habitat was observed during field investigations within ELC-035, ELC-035a, ELC-045, ELC-046, ELC-046a, ELC-047, ELC-141, ELC-169 and ELC-192. Targeted crepuscular bird surveys were not completed during the preliminary field investigations.
Bird	Least bittern	<i>Ixobrychus exilis</i>	THR	THR	Medium	Candidate Suitable vegetation communities (MAS) are present along the banks of the Holland River (ELC-083, ELC-095, ELC-096 and ELC-124). Targeted surveys (i.e., call playback surveys) required to confirm species presence/absence were not completed during the preliminary field investigations.
Mammals	Little brown myotis	<i>Myotis lucifugus</i>	END	END	Medium	Candidate Forested communities with suitable roosting habitat were present. Targeted surveys for Species at Risk bats (i.e., acoustic monitoring) were not completed during preliminary field investigations.
Mammals	Eastern small-footed myotis	<i>Myotis leibii</i>	END	-	Medium	Candidate Forested communities with suitable roosting habitat were present. Targeted surveys for Species at Risk bats (i.e., acoustic monitoring) were not completed during preliminary field investigations.
Mammals	Northern long-eared myotis	<i>Myotis septentrionalis</i>	END	END	Medium	Candidate Forested communities with suitable roosting habitat were present. Targeted surveys for Species at Risk bats (i.e., acoustic monitoring) were not completed during preliminary field investigations.
Mammals	Tri-colored bat	<i>Perimyotis subflavus</i>	END	END	Medium	Candidate Forested communities with suitable roosting habitat were present. Targeted surveys for Species at Risk bats (i.e., acoustic monitoring) were not completed during preliminary field investigations.
Plant	Black ash	<i>Fraxinus nigra</i>	END	THR	High	Confirmed Species located within the following vegetation communities: ELC-098, ELC-120, ELC-140, ELC-142, ELC-142a, ELC-154 and ELC-154a.
Plant	Butternut	<i>Juglans cinerea</i>	END	END	High	Confirmed Species located within the following vegetation communities: ELC-046, ELC-046a, ELC-047 and ELC-192.
Reptile	Blanding's turtle	<i>Emydoidea blandingii</i>	THR	THR	Medium	Candidate Suitable wetland communities (SW, MA and SA) are present along the east and west branches of the Holland River (ELC-124, ELC-083, ELC-085, ELC-095, ELC-096, ELC-120, ELC-121, ELC-122, ELC-123 and ELC-125). Targeted surveys for Blanding's turtle were not completed during preliminary field investigations.

Figure 2-3a: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

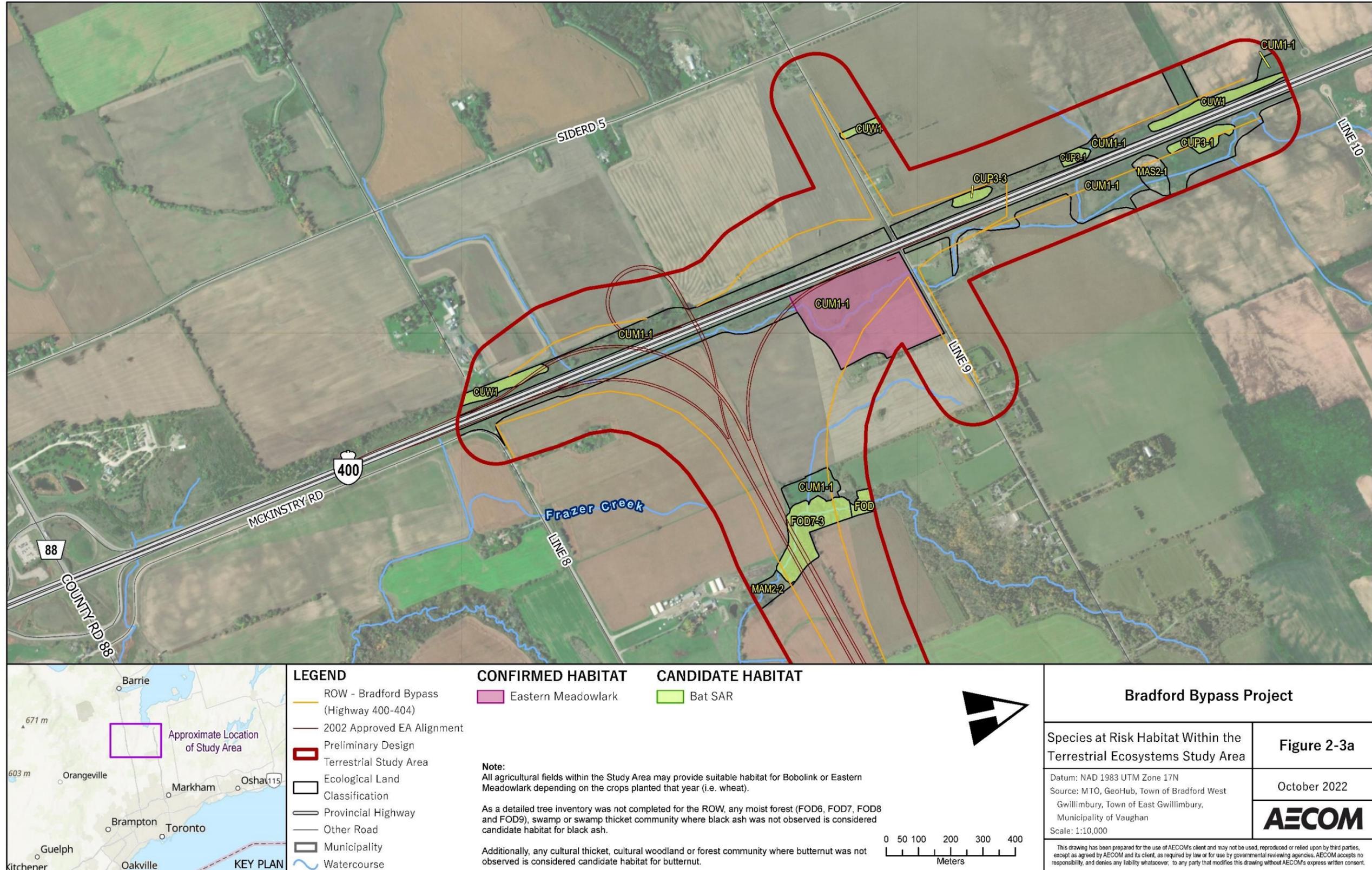


Figure 2-3b: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

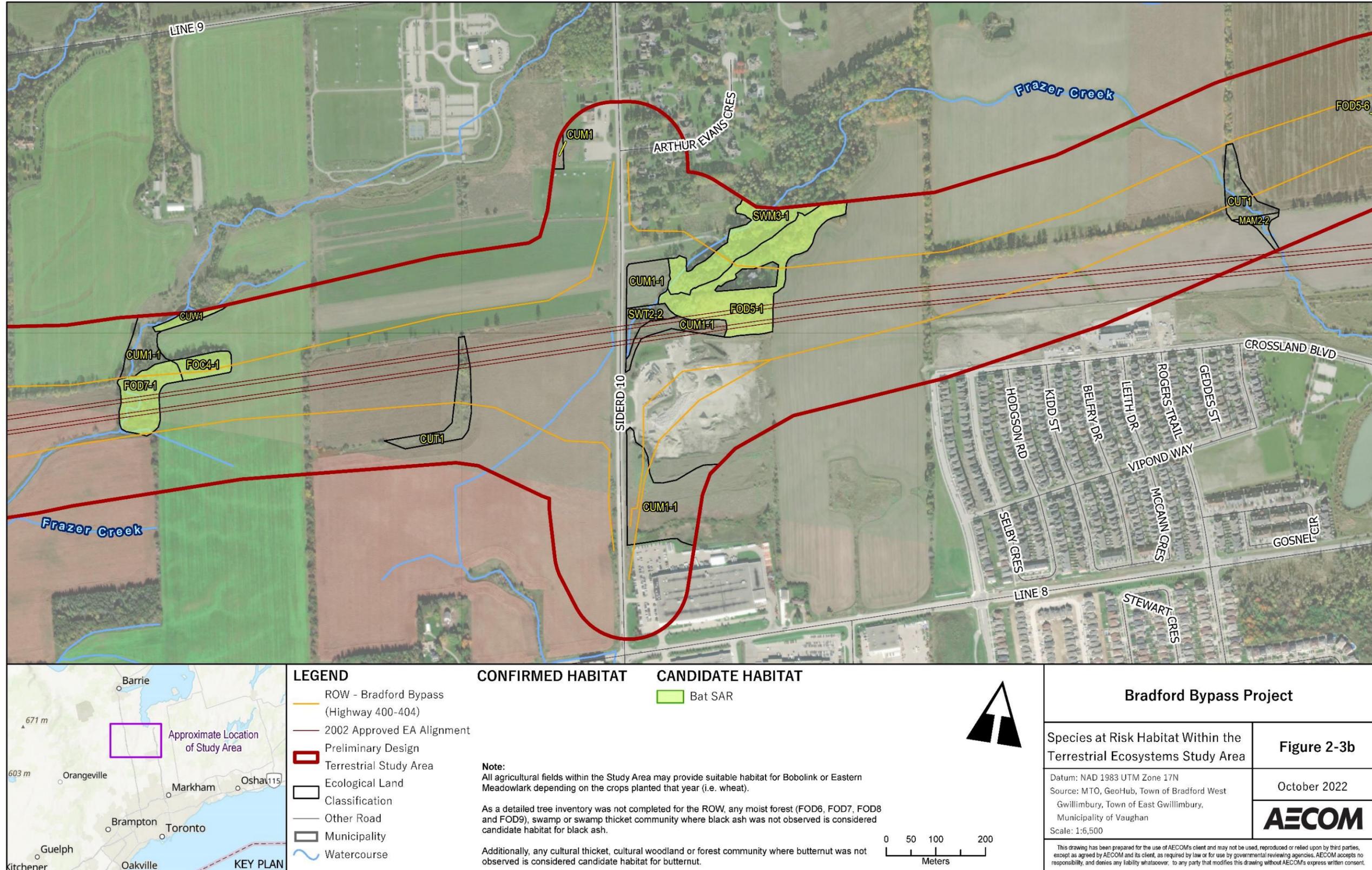


Figure 2-3c: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

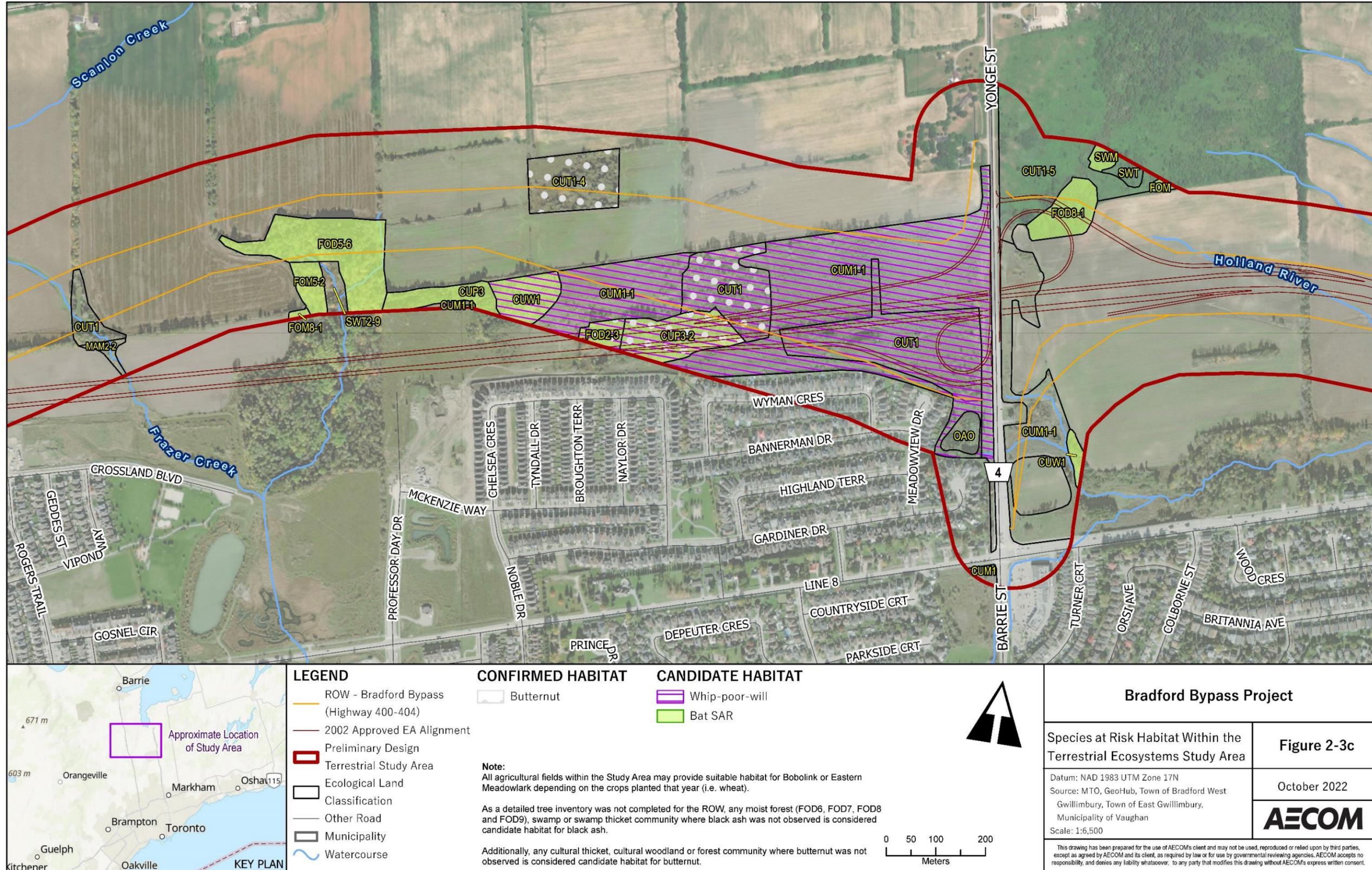


Figure 2-3d: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

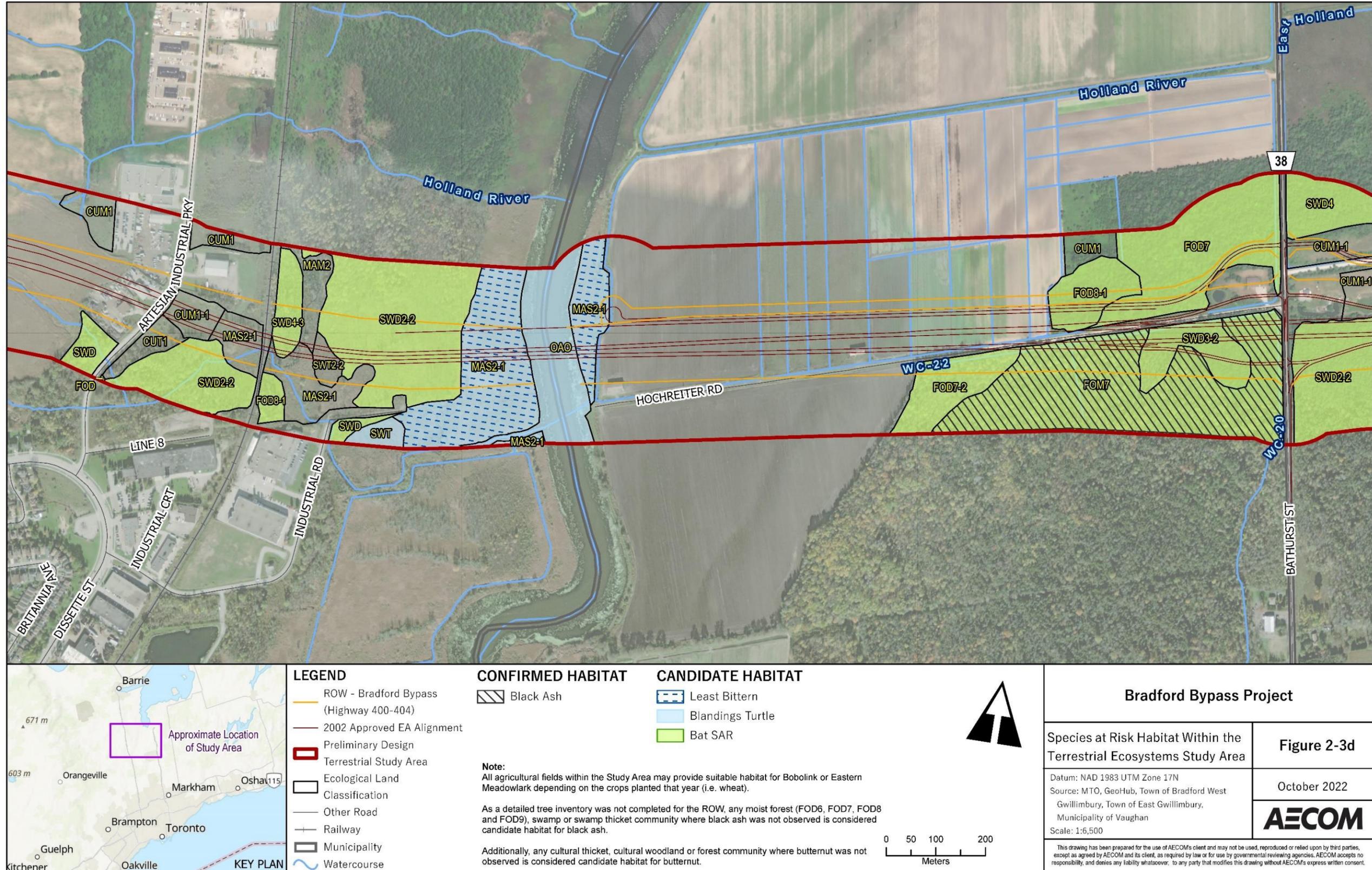


Figure 2-3e: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

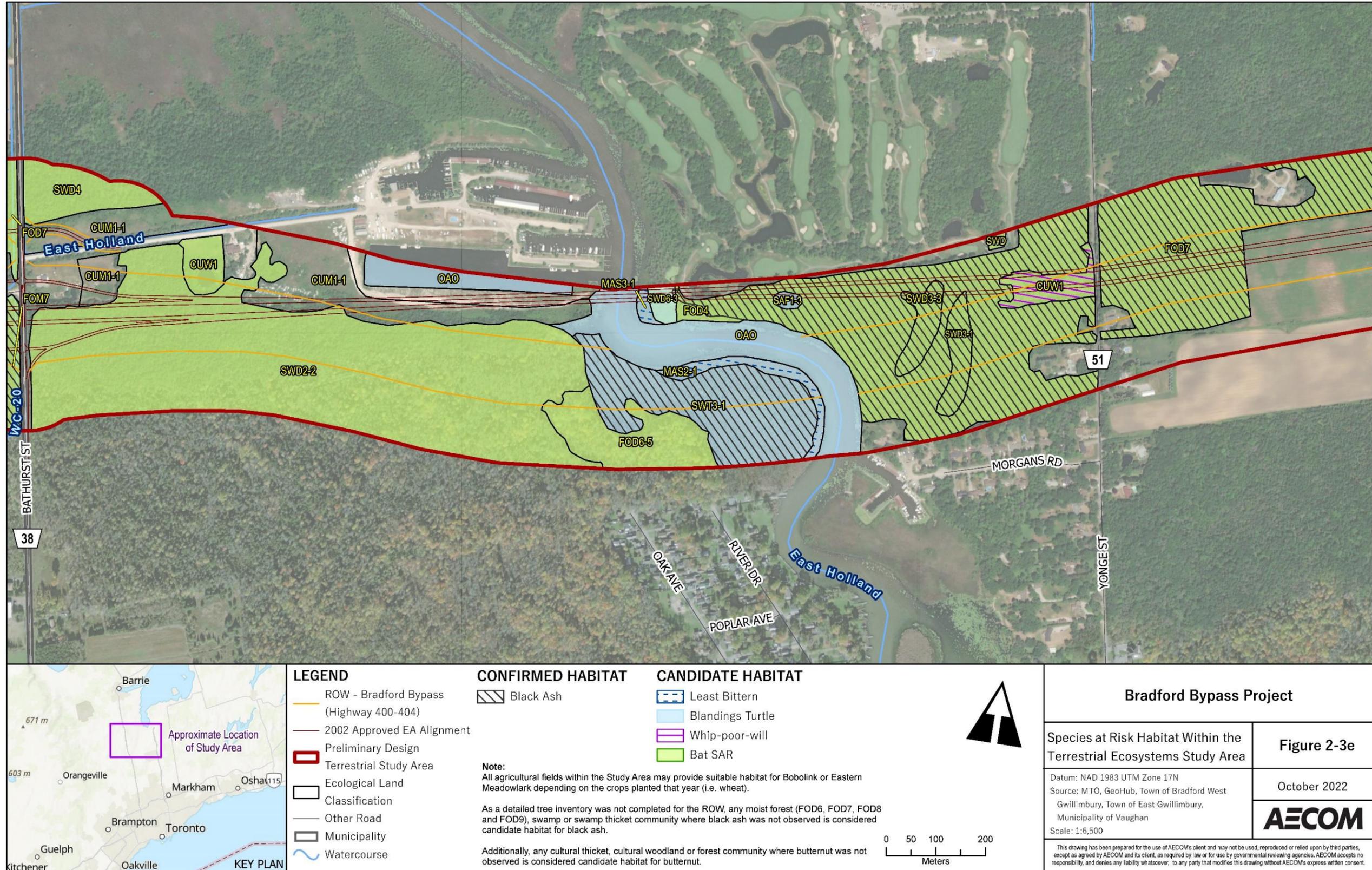


Figure 2-3f: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area

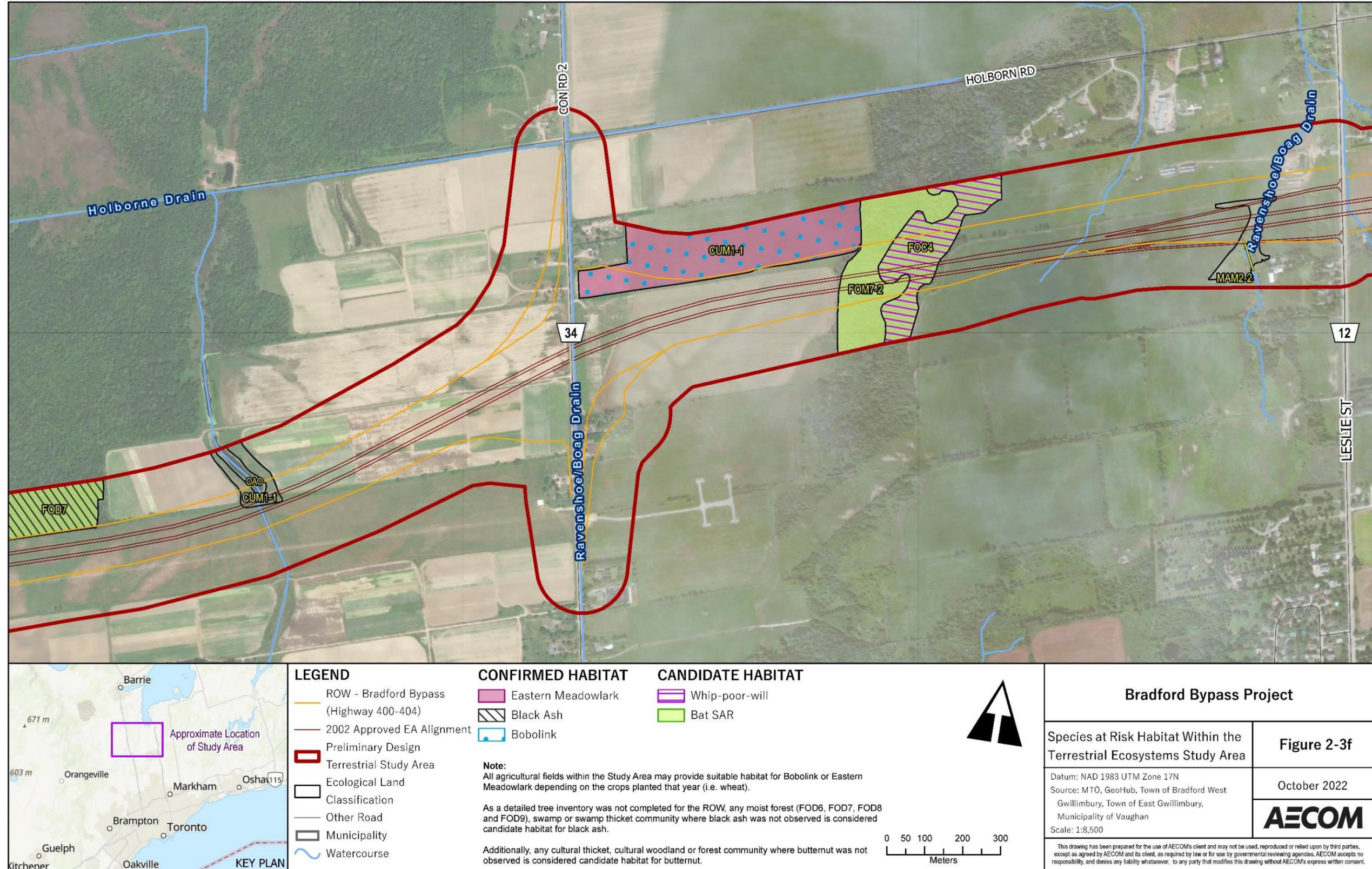
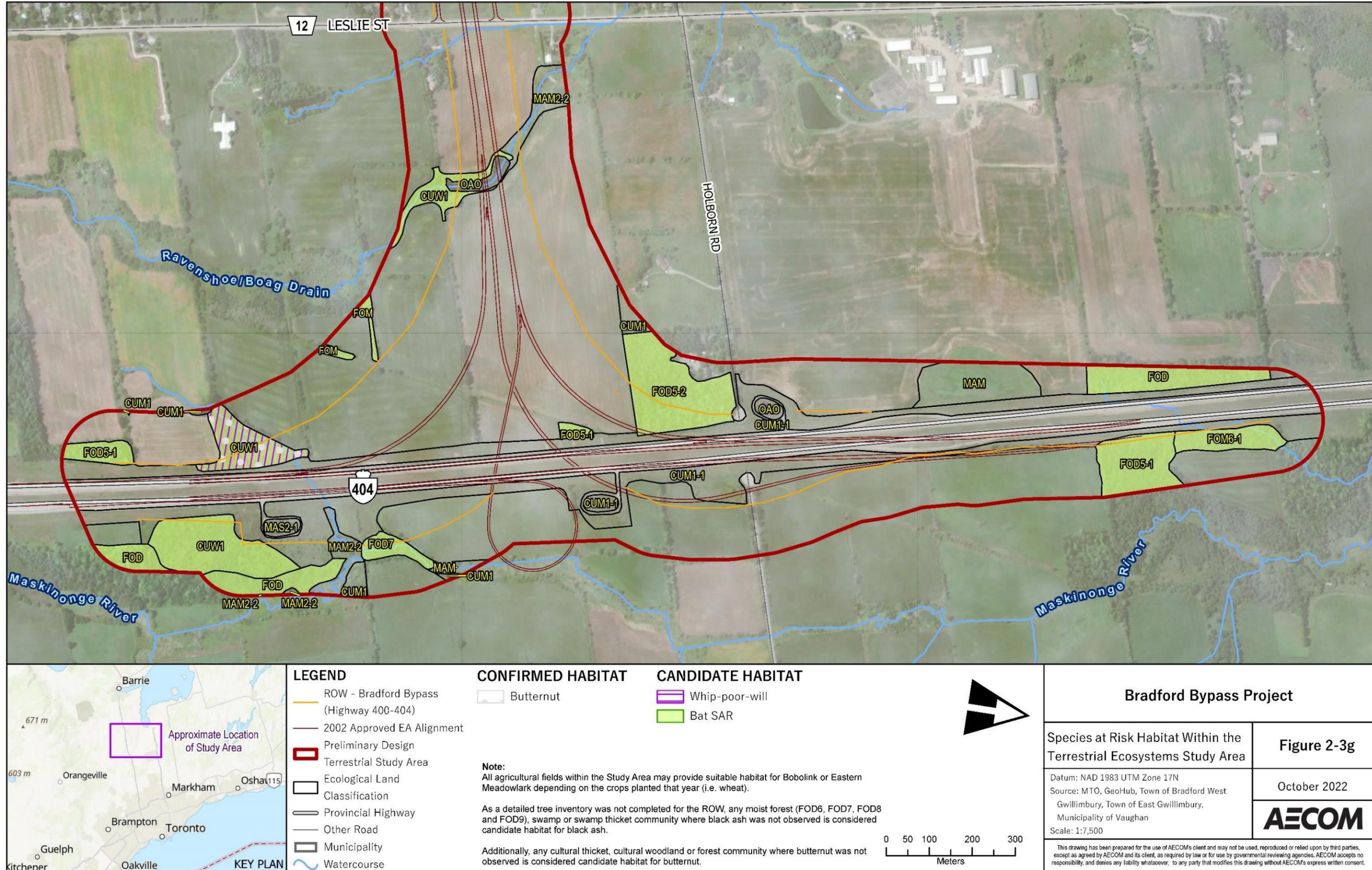


Figure 2-3g: Species at Risk Habitat Within the Terrestrial Ecosystems Study Area



Potential for bat Species at Risk occurred throughout the Terrestrial Ecosystems Study Area and is represented by forests, swamps, and cultural woodlands. Additionally, buildings within the Terrestrial Ecosystems Study Area may also provide suitable roosting habitat. Presence/absence of bat Species at Risk was not confirmed as targeted surveys (i.e., acoustic monitoring) were not performed. Similarly, suitable wetland and/or open water habitat for Blanding's turtle (*Emydoidea blandingii*) was observed within the Holland River and adjacent Provincially Significant Wetlands. Suitable wetland nesting habitat for least bittern was also observed along the Holland River. Suitable clearings for nesting for eastern whip-poor-will were observed within the Terrestrial Ecosystems Study Area. Species presence/absence could not be confirmed as targeted surveys (e.g., visual encounter surveys, crepuscular surveys, and marsh breeding bird callback surveys) were not performed.

2.1.1.3.5 Significant Wildlife Habitat

Based on a review of the background information sources listed in **Section 2.1.1.2**, the presence of Deer Wintering Areas and Special Concern and Rare Wildlife Species were identified within the vicinity of the Terrestrial Ecosystems Study Area, as shown on **Figure 2-4**. The Deer Wintering Area (Stratum 2) was largely congruent with the Holland Marsh Wetland Complex and overlaps along the Terrestrial Ecosystems Study Area in multiple locations east of the Holland River. There were also records of 18 Species of Conservation Concern in the vicinity of the Terrestrial Ecosystems Study Area. Species of Conservation Concern records included 10 bird species, one amphibian species, two reptile species, two insect species and three plants species. Of the 18 Species of Conservation Concern, 14 are considered Special Concern under the Endangered Species Act. These Species of Conservation Concern are listed in **Table 2-8** below.

A screening for Species of Conservation Concern was completed separately following the same methods for the Species at Risk habitat screening described in **Section 2.1.1.3.4**. The results of the Significant Wildlife Habitat and Species of Conservation Concern screening is summarized in **Table 2-8** below.

Table 2-8: Species of Conservation Concern Records Within the Terrestrial Ecosystems Study Area

Taxa	Common Name	Scientific Name	S-Rank ¹	Endangered Species Act Status ²	Committee on the Status of Endangered Wildlife in Canada Status ³	Species at Risk Act Status	Source of Record	Date of Most Recent Observation
Bird	Bald eagle	<i>Haliaeetus leucocephalus</i>	S2N,S4B	Special Concern	Not at Risk	N/A	Ministry of the Environment, Conservation and Parks	N/A
Bird	Black tern	<i>Chlidonias niger</i>	S3B	Special Concern	Not at Risk	N/A	Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2001-2005
Bird	Canada warbler	<i>Cardellina canadensis</i>	S4B	Special Concern	Special Concern	Threatened	2002 Approved Environmental Assessment, Ontario Breeding Bird Atlas	2001-2005
Bird	Common nighthawk	<i>Chordeiles minor</i>	S4B	Special Concern	Special Concern	Threatened	2002 Approved Environmental Assessment, Ontario Breeding Bird Atlas	2001-2005
Bird	Eastern wood-pewee	<i>Contopus virens</i>	S4B	Special Concern	Special Concern	Special Concern	2002 Approved Environmental Assessment, Ontario Breeding Bird Atlas	2001-2005
Bird	Golden-winged warbler	<i>Vermivora chrysoptera</i>	S4B	Special Concern	Threatened	Threatened	2002 Approved Environmental Assessment, Ontario Breeding Bird Atlas	2001-2005
Bird	Grasshopper sparrow	<i>Ammodramus savannarum</i>	S4B	Special Concern	Special Concern	N/A	Ontario Breeding Bird Atlas	2001-2005
Bird	Peregrine falcon	<i>Falco peregrinus</i>	S3B	Special Concern	Not at Risk	N/A	Ministry of the Environment, Conservation and Parks	N/A
Bird	Wood thrush	<i>Hylocichla mustelina</i>	S4B	Special Concern	Threatened	Threatened	2002 Approved Environmental Assessment, Natural Heritage Information Centre, Ontario Breeding Bird Atlas	2001-2005
Bird	Yellow rail	<i>Coturnicops noveboracensis</i>	S4B	Special Concern	Special Concern	Special Concern	Natural Heritage Information Centre	1985
Amphibian	Western chorus frog (Great Lakes/St. Lawrence – Canadian Shield population)	<i>Pseudacris maculata</i>	S3	Not at Risk	Threatened	Threatened	Ontario Reptile Amphibian Atlas	2017
Reptiles	Northern map turtle	<i>Graptemys geographica</i>	S3	Special Concern	Special Concern	Special Concern	Ontario Reptile Amphibian Atlas	1993
Reptiles	Snapping turtle	<i>Chelydra serpentina</i>	S3	Special Concern	Special Concern	Special Concern	Ontario Reptile Amphibian Atlas	2019
Insect	Green-striped darner	<i>Aeshna verticalis</i>	S3	No Status	No Status	N/A	Natural Heritage Information Centre	1941
Insect	Monarch	<i>Danaus plexippus</i>	S2N,S4B	Special Concern	Endangered	Special Concern	Ontario Butterfly Atlas	2018
Plants	Early-branching panicgrass	<i>Dichanthelium praecocius</i>	S3	No Status	No Status	N/A	Natural Heritage Information Centre	1977
Plants	Houghton's flatsedge	<i>Cyperus houghtonii</i>	S3	No Status	No Status	N/A	Natural Heritage Information Centre	1976
Plants	Bristly buttercup	<i>Ranunculus hispidus</i>	S3	No Status	No Status	N/A	2002 Approved Environmental Assessment	1995

Notes: 1. S2 – Imperilled, S3 – Vulnerable, S4 – Apparently, S#B/S#N – Breeding/Non-breeding

2. SC – Special Concern, THR – Threatened, END – Endangered, NAR – Not at Risk, ESA – Endangered Species Act (2007), SARA – Species at Risk Act (2002), COSEWIC – The Committee on the Status of Endangered Wildlife in Canada

3. OBBA – Ontario Breeding Bird Atlas, NHIC – Natural Heritage Information Center, MECP – Ministry of Environment Conservation and Parks, EA – Approved 2002 EA, ORAA – Ontario Reptile Amphibian Atlas, OBA – Ontario Butterfly Atlas

4. Date represents most recent observation date prior to the completion of the BBP field investigations.

Nine candidate Significant Wildlife Habitats were identified to potentially occur in the Terrestrial ecosystems Study Area based on information collected through a review of available background resources and interpretation of aerial photography. The following provides details regarding candidate Significant Wildlife Habitats:

- **Bat Maternity Colonies** – bat species may use deciduous forest (FOD), mixed forest (FOM) deciduous swamp (SWD) and mixed swamp (SWM) communities, which provide potentially suitable habitat for maternity roosting, where tree cavities or loose bark are present. Forested areas within the Study Area presented suitable characteristics for use by bats, but this has not been confirmed through acoustic monitoring.
- **Marsh Breeding Bird Habitat** – Large shallow marsh (MAS) and swamp thicket (SWT) communities present along the banks of the Holland River and Holland River East Branch presented suitable characteristics for use by local and migrant waterfowl populations during the spring or fall migration. Green Heron (BBS-15) and Marsh Wren (BBS-10) were both observed during breeding bird surveys. However, confirmed nesting was not observed for either species
- **Raptor Wintering Area** – Candidate Raptor Wintering Habitat was identified in the naturalized area located directly west of County Road 4. The candidate habitat was noted to be greater than 20 hectares in size and provided a combination of deciduous forest, mixed forest, woodland, thicket and meadow vegetation communities.
- **Reptile Hibernaculum** – Candidate reptile hibernaculum sites were observed within the Dry - Fresh Sugar Maple Deciduous Forest (FOD5-1) community east of Side Road 10, the Mineral Cultural Woodland (CUW1) community west of County Road 4 and the Mineral Cultural Thicket (CUT1) community east of Artesian Industrial Parkway.
- **Turtle Nesting Areas** – Suitable conditions for turtle nesting were observed in the CUM1-1 community located west of the Holland River East Branch
- **Turtle Wintering Areas** – Suitable habitat for overwintering turtles was observed within the wetland communities present along both the Holland River and Holland River East Branch.
- **Waterfowl Stopover and Staging Areas (Aquatic)** – Large shallow marsh (MAS) and swamp thicket (SWT) communities noted to be present along the banks of the Holland River and Holland River East Branch presented suitable

characteristics for use by local and migrant waterfowl populations during the spring or fall migration.

- **Waterfowl Stopover and Staging Areas (Terrestrial)** - Agricultural fields within the Study Area were noted to possibly experience suitable amounts of spring melt and/or flooding and were considered significant stopover and staging areas for waterfowl.
- **Woodland Raptor Nesting Habitat** – Several forest and swamp communities located in the vicinity of the Holland River and the Holland River East Branch were noted to be part of a more extensive, contiguous forest system that meets the size criteria to be considered candidate habitat.

Further analysis using the results of the field investigations and additional input received from the Ministry of Natural Resources and Forestry (June 2022) confirmed the presence of six Significant Wildlife Habitat types within the Terrestrial Ecosystems Study Area. The following provides details regarding confirmed Significant Wildlife Habitats:

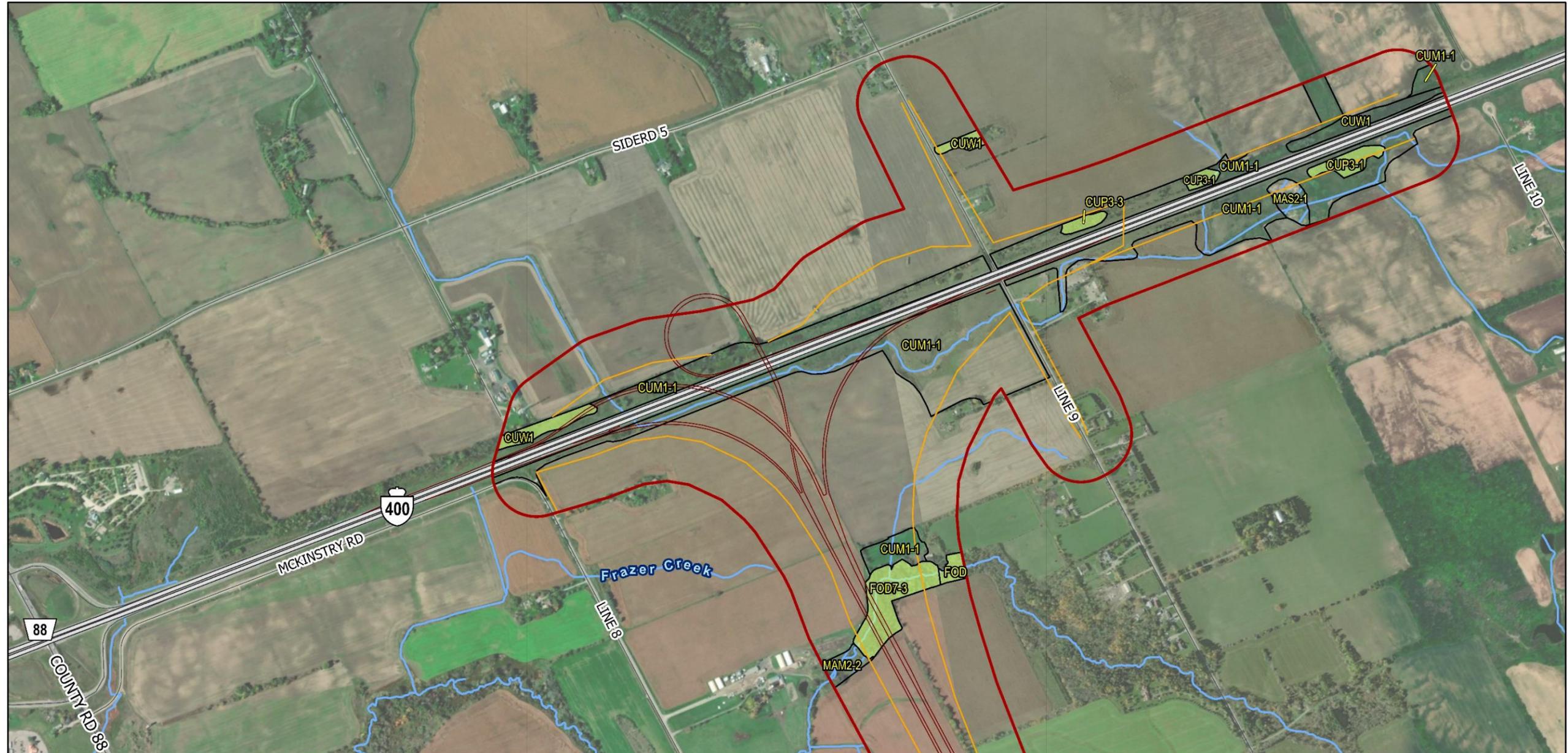
- **Amphibian Breeding Habitat (Wetlands)** - The required number of indicator species were recorded calling with a Call Code Level of 3 at both amphibian call stations AMP-01 and AMP-02. A chorus of American Toads and Spring Peepers were recorded at AMP-01 on April 10, 2021 and a chorus of Wood Frogs and Spring Peepers were recorded at AMP-02 during the same evening. Both the Willow Mineral Deciduous Thicket Swamp (SWT2-2) and Birch - Conifer Mineral Mixed Swamp Type (SWM3-1) communities associated with AMP-01 and the Gray Dogwood Mineral Deciduous Thicket Swamp (SWT2-9) community associated with AMP-02 are considered confirmed Amphibian Breeding Habitat. Additionally, the Open Aquatic (OAO) community associated with AMP-12 is also conservatively being considered confirmed Amphibian Breeding Habitat, as first and second round surveys could not be completed at the station due to access restrictions.
- **Deer Yarding and Winter Congregation Areas:** Suitable woodlands reduce impacts of winter conditions and are identified by large annual congregations of White-tailed Deer. Ministry of Natural Resources and Forestry has confirmed the presence of this Significant Wildlife Habitats within the Terrestrial Ecosystems Study Area.
- **Seeps and Springs:** Seeps and springs are important feeding and drinking areas, especially in the winter and will typically support a variety of plant and animal species. Evidence of a seepage area was observed during field investigations in vegetation community ELC-122.

- **Special Concern and Rare Wildlife Species:** Special Concern and Provincially Rare (S1-S3, SH) plants and animals are rare and/or have experienced population declines in Ontario. Field investigations confirmed the presence of these species and/or suitable habitat within the Terrestrial Ecosystems Study Area (**Table 2-9**).
- **Terrestrial Crayfish:** chimneys were observed in the SWT2-9 community west of County Road 4
- **Other Rare Vegetation Communities** - An FOD2-3 community (S3S4) was confirmed within the Study Area, west of County Road 4. This community is located outside of the proposed Ministry right-of-way.

Table 2-9: Species of Conservation Concern Identified with Medium or High Potential to Occur Within the Terrestrial Ecosystems Study Area

Taxa	Common Name	Scientific Name	S-Rank	Endangered Species Act Status	Probability of Occurrence	Confirmed or Candidate Habitat
Birds	Common nighthawk	Chordeiles minor	S4B	Special Concern	Medium	Candidate Suitable habitat was observed during field investigations within ELC-035, ELC-035a, ELC-045, ELC-046, ELC-046a, ELC-047, ELC-141, ELC-169 and ELC-192. Targeted crepuscular bird surveys were not completed as part of the preliminary field investigations.
Birds	Eastern wood-pewee	Contopus virens	S4B	Special Concern	High	Confirmed Species and suitable habitat were observed during field investigations within ELC-013, ELC-018, ELC-028, ELC-029, ELC-046, ELC-098, ELC-099, ELC-113, ELC-119a.
Birds	Wood thrush	Hylocichla mustelina	S4B	Special Concern	High	Confirmed Species and suitable habitat were observed during field investigations within ELC-140, ELC-142, ELC142a, ELC-169, ELC-172.
Insects	Monarch	Danaus plexippus	S2N, S4B	Special Concern	High	Confirmed Species and suitable habitat were observed during field investigations within ELC-004, ELC-005, ELC-013, ELC-029, ELC-177, ELC-200, ELC-201 and ELC-213.
Reptile	Northern map turtle	Graptemys geographica	S3	Special Concern	Medium	Candidate Suitable habitat was observed during field investigations within ELC-085, ELC-125, ELC-159. Targeted surveys were not completed as part of the preliminary field investigations.
Reptile	Snapping turtle	Chelydra serpentina	S3	Special Concern	Medium	Candidate Suitable habitat was observed during field investigations within ELC-083, ELC-085, ELC-095, ELC-096, ELC-120, ELC-121, ELC-122, ELC-123, ELC-124, ELC-125, ELC-186. Targeted surveys were not completed as part of the preliminary field investigations.

Figure 2-4a: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area



LEGEND ROW - Bradford Bypass (Highway 400-404) 2002 Approved EA Alignment Preliminary Design Terrestrial Study Area Ecological Land Classification Municipality Watercourse Provincial Highway Other Road	CANDIDATE HABITAT Bat Maternity Colonies Terrestrial Crayfish Habitat	

Bradford Bypass Project	
Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area	Figure 2-4a
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan Scale: 1:10,000	
AECOM	
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Figure 2-4b: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area

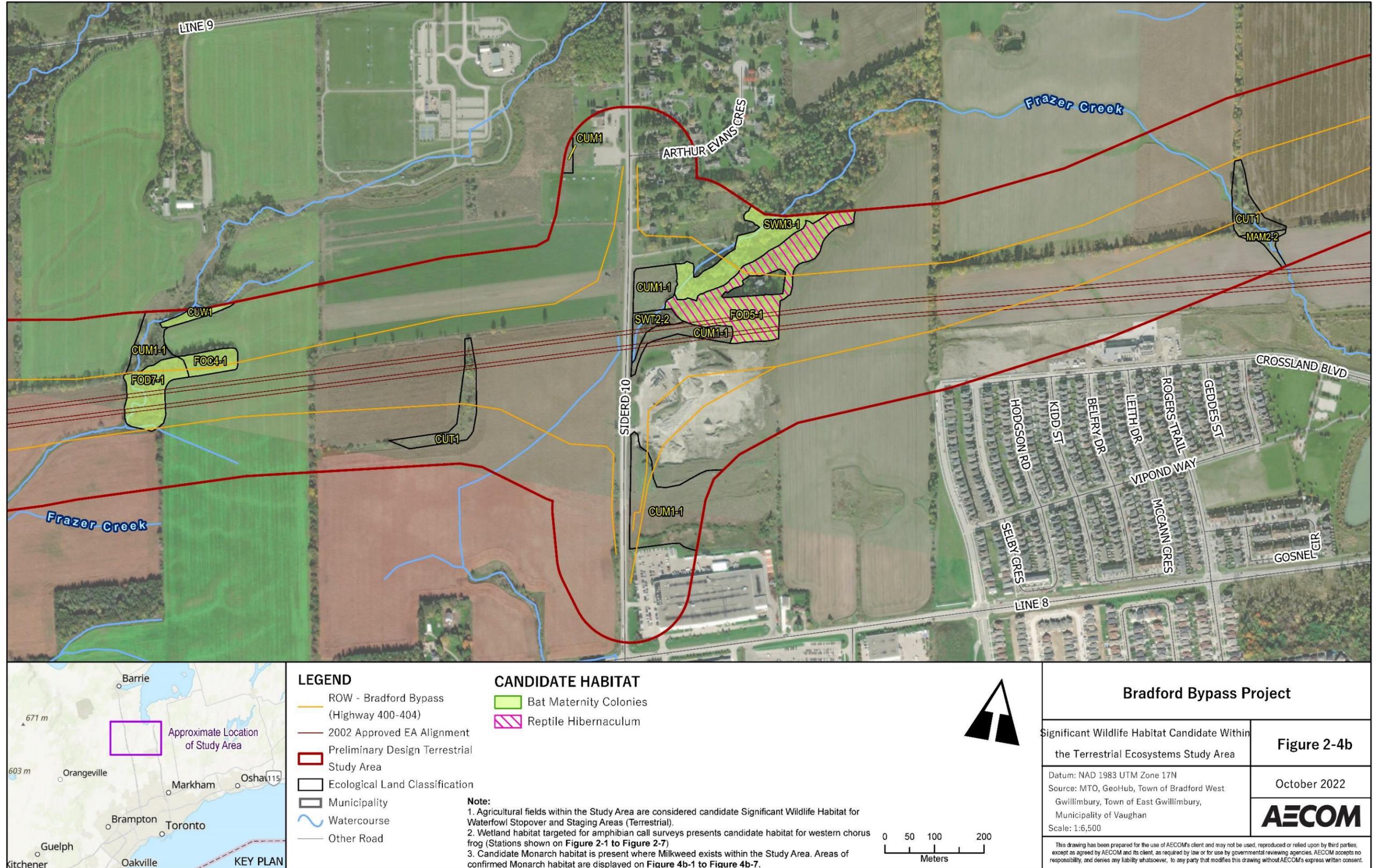
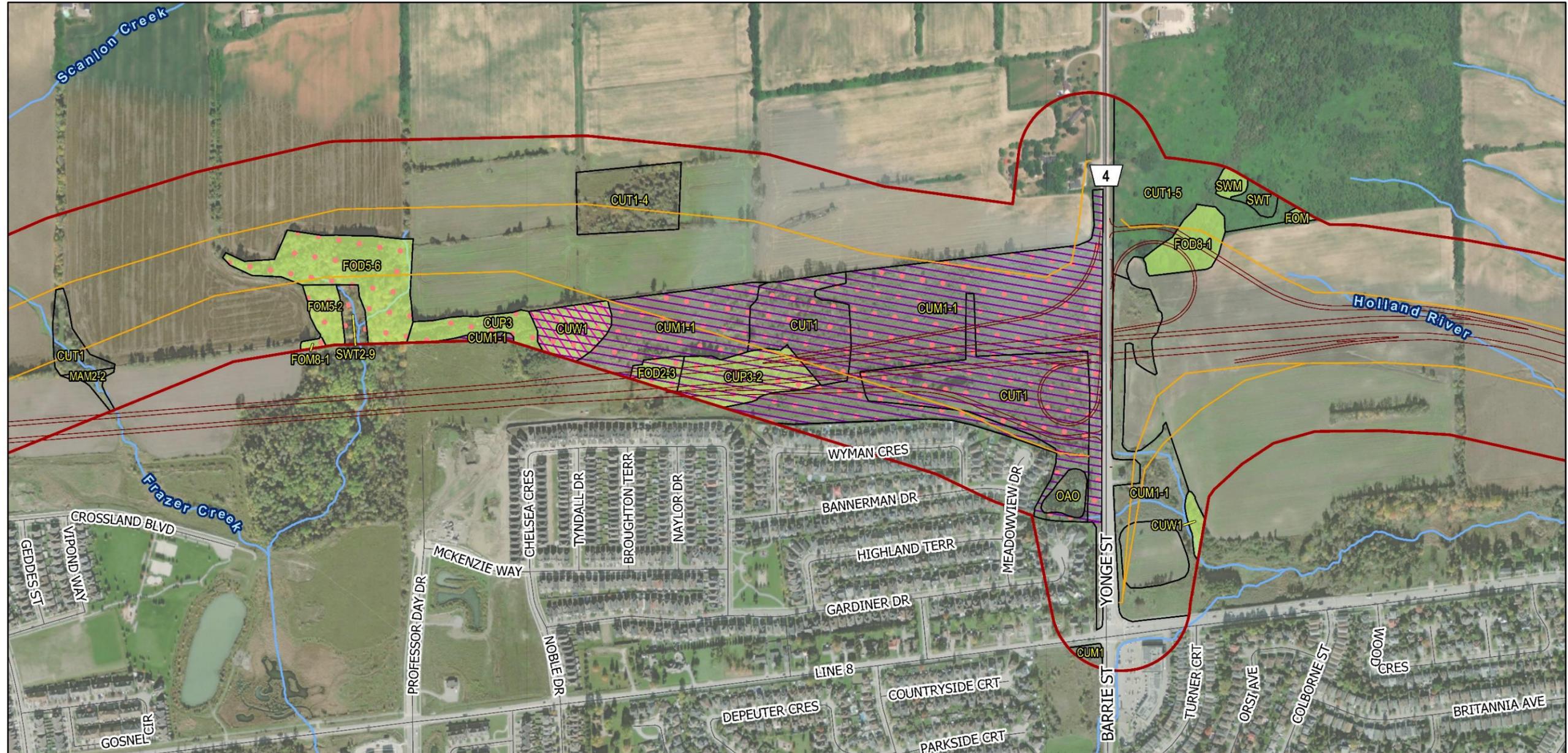
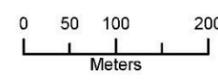


Figure 2-4c: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area

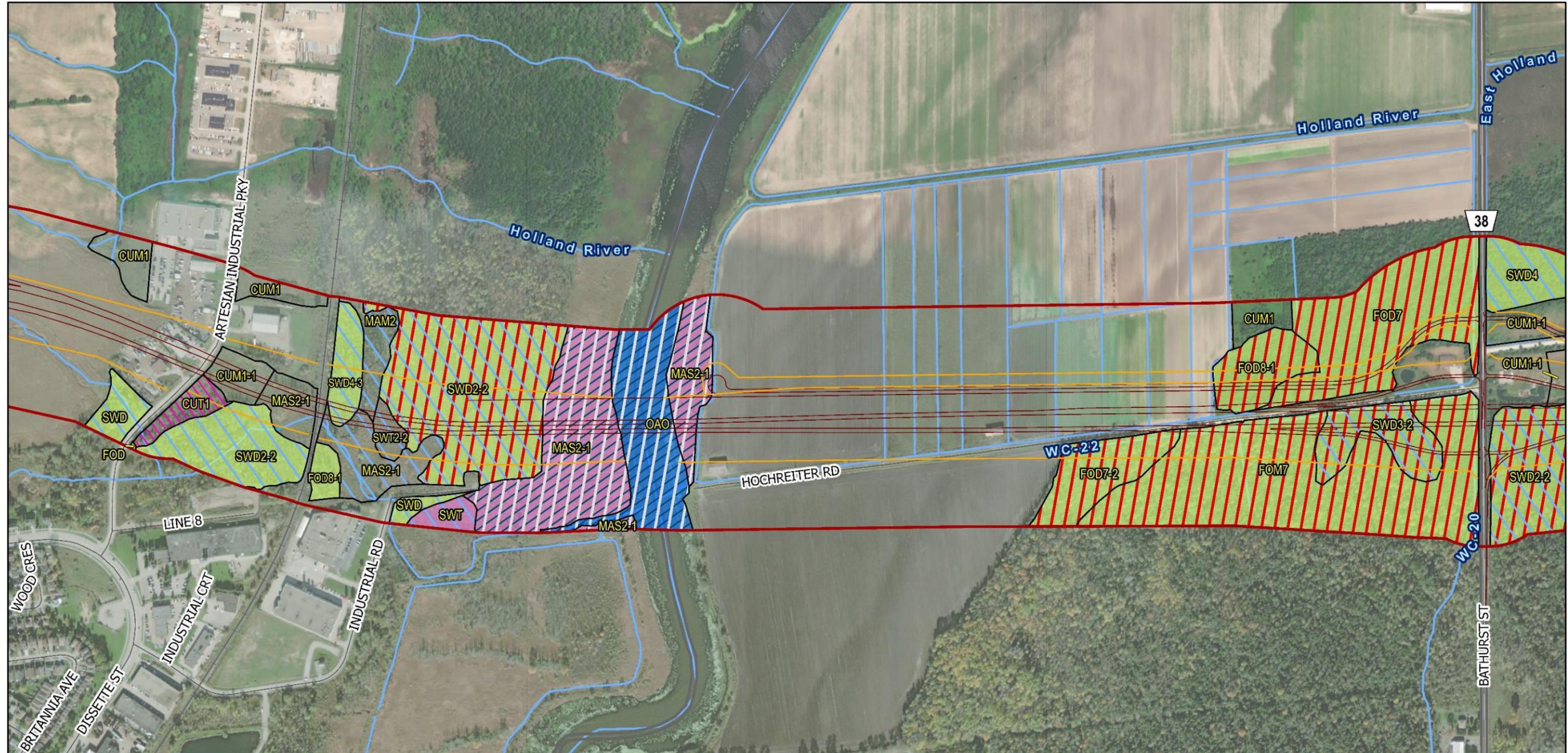


LEGEND		CANDIDATE HABITAT	
	ROW - Bradford Bypass (Highway 400-404)		Common Nighthawk Habitat (SC)
	2002 Approved EA Alignment		Raptor Wintering Area
	Preliminary Design Terrestrial Study Area		Bat Maternity Colonies
	Ecological Land Classification		Reptile Hibernaculum
	Municipality	Note:	
	Watercourse	1. Agricultural fields within the Study Area are considered candidate Significant Wildlife Habitat for Waterfowl Stopover and Staging Areas (Terrestrial).	
	Other Road	2. Wetland habitat targeted for amphibian call surveys presents candidate habitat for western chorus frog (Stations shown on Figure 2-1 to Figure 2-7)	
		3. Candidate Monarch habitat is present where Milkweed exists within the Study Area. Areas of confirmed Monarch habitat are displayed on Figure 4b-1 to Figure 4b-7.	



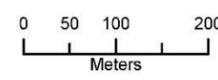
Bradford Bypass Project	
Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area	Figure 2-4c
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan Scale: 1:6,500	October 2022
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Figure 2-4d: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area



LEGEND		CANDIDATE HABITAT	
	ROW - Bradford Bypass (Highway 400-404)		Bat Maternity Colonies
	2002 Approved EA Alignment		Snapping Turtle (SC)
	Preliminary Design Terrestrial Study Area		Terrestrial Crayfish Habitat
	Ecological Land Classification		Waterfowl Stopover & Staging Areas (Aquatic)
	Municipality		Woodland Raptor Nesting Habitat
	Watercourse		Turtle Wintering Area
	Other Road		Northern Map Turtle (SC)
	Railway		Reptile Hibernaculum

Note:
 1. Agricultural fields within the Study Area are considered candidate Significant Wildlife Habitat for Waterfowl Stopover and Staging Areas (Terrestrial).
 2. Wetland habitat targeted for amphibian call surveys presents candidate habitat for western chorus frog (Stations shown on Figure 2-1 to Figure 2-7)
 3. Candidate Monarch habitat is present where Milkweed exists within the Study Area. Areas of confirmed Monarch habitat are displayed on Figure 4b-1 to Figure 4b-7.



Bradford Bypass Project	
Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area	Figure 2-4d
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan Scale: 1:6,500	October 2022
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Figure 2-4e: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area

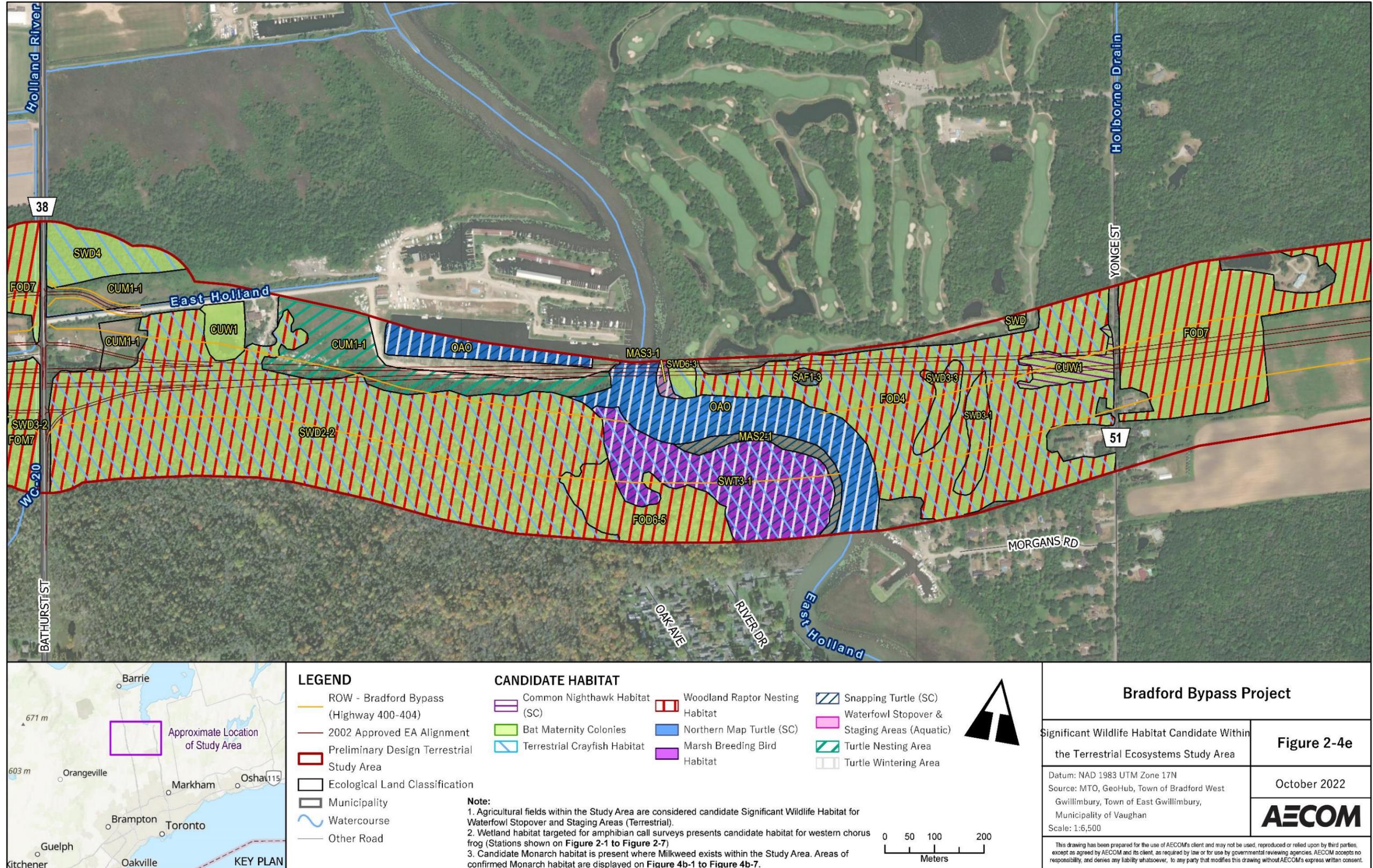
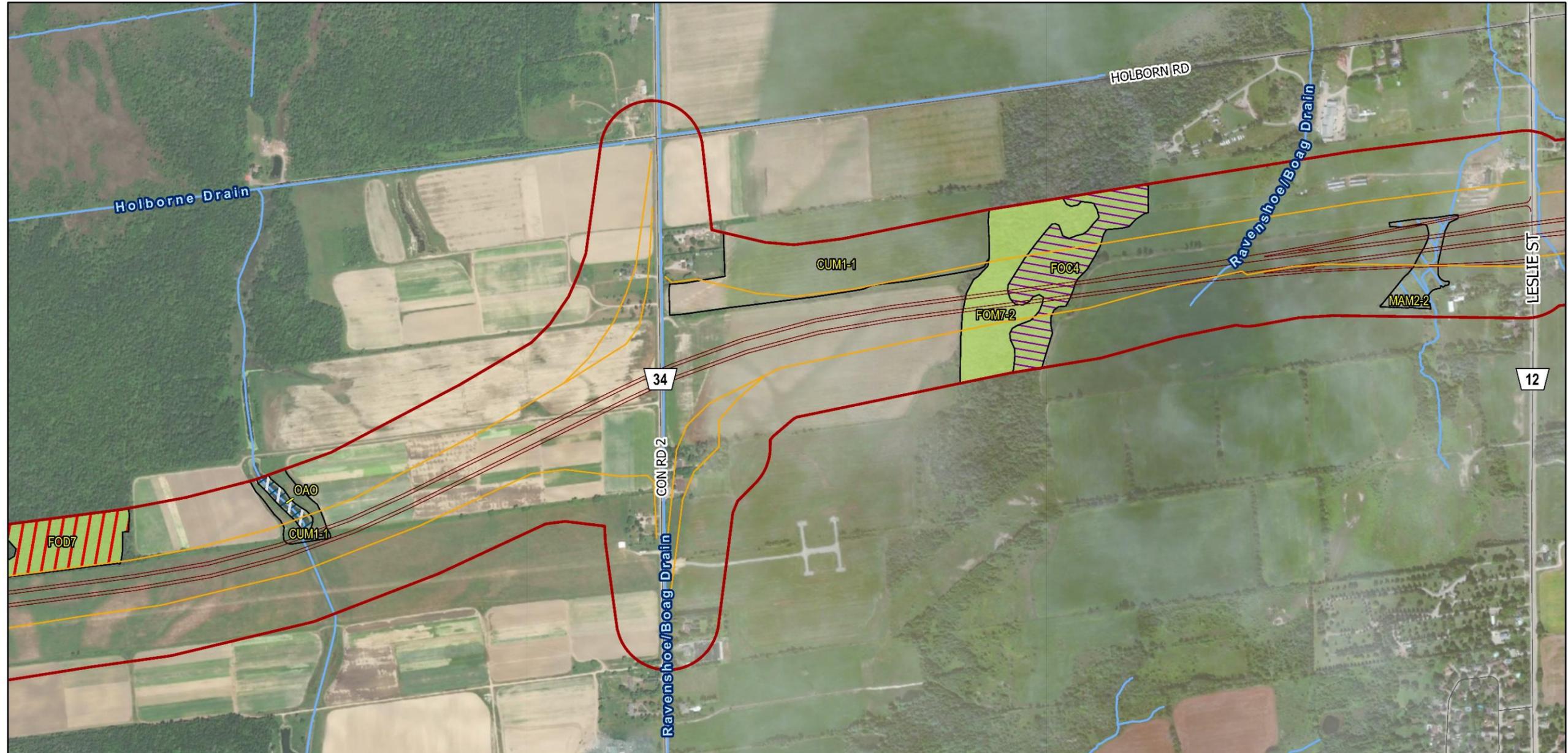


Figure 2-4f: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area



LEGEND		CANDIDATE HABITAT	
	ROW - Bradford Bypass (Highway 400-404)		Common Nighthawk Habitat (SC)
	2002 Approved EA Alignment		Bat Maternity Colonies
	Preliminary Design Terrestrial Study Area		Terrestrial Crayfish Habitat
	Ecological Land Classification		Woodland Raptor Nesting Habitat
	Municipality		Snapping Turtle (SC)
	Watercourse		Turtle Wintering Area
	Other Road		

Note:
 1. Agricultural fields within the Study Area are considered candidate Significant Wildlife Habitat for Waterfowl Stopover and Staging Areas (Terrestrial).
 2. Wetland habitat targeted for amphibian call surveys presents candidate habitat for western chorus frog (Stations shown on Figure 2-1 to Figure 2-7)
 3. Candidate Monarch habitat is present where Milkweed exists within the Study Area. Areas of confirmed Monarch habitat are displayed on Figure 4b-1 to Figure 4b-7.

Bradford Bypass Project	
Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area	Figure 2-4f
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan	October 2022
Scale: 1:8,600	
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Figure 2-4g: Significant Wildlife Habitat Candidate Within the Terrestrial Ecosystems Study Area

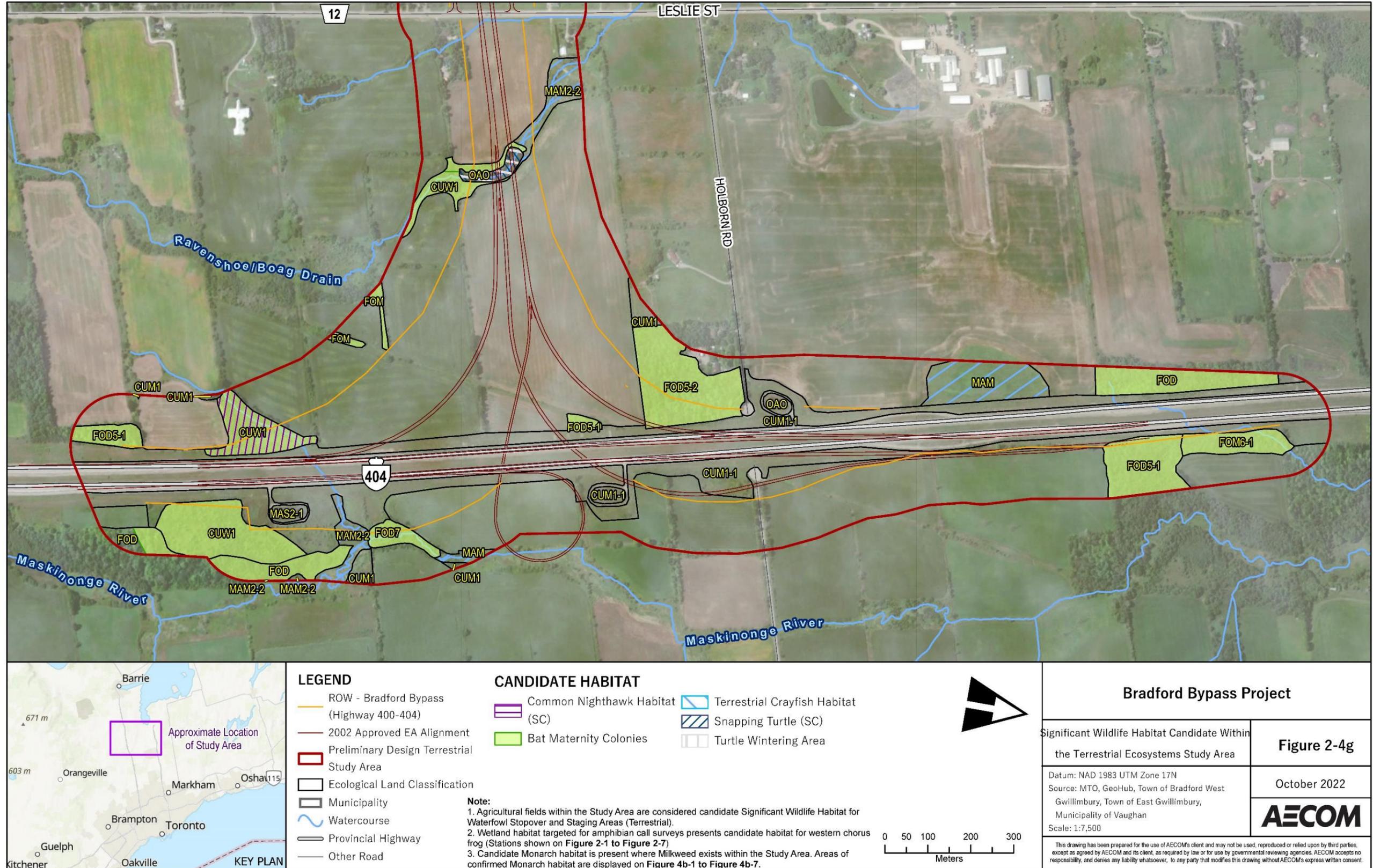


Figure 2-5a: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area

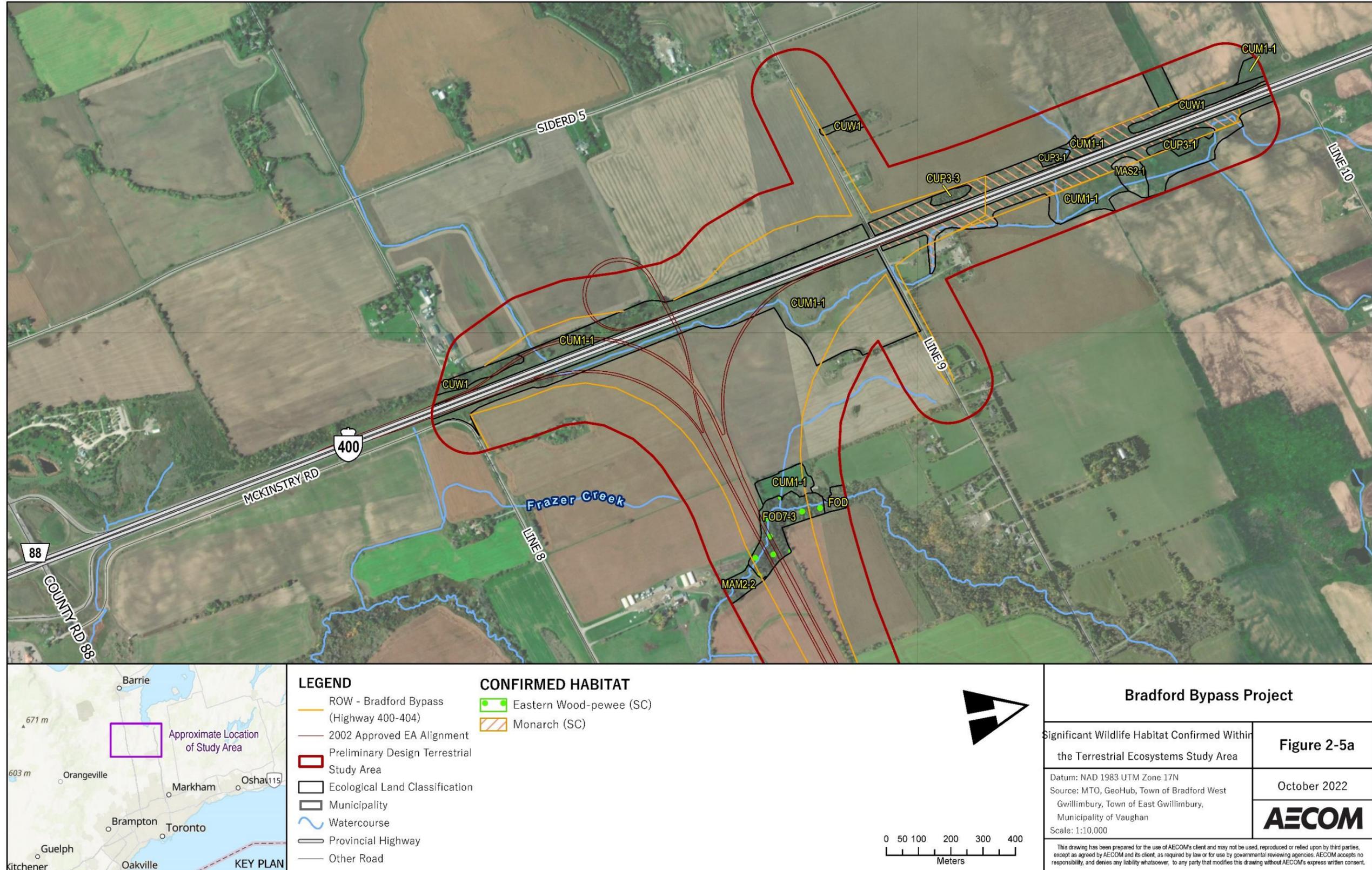
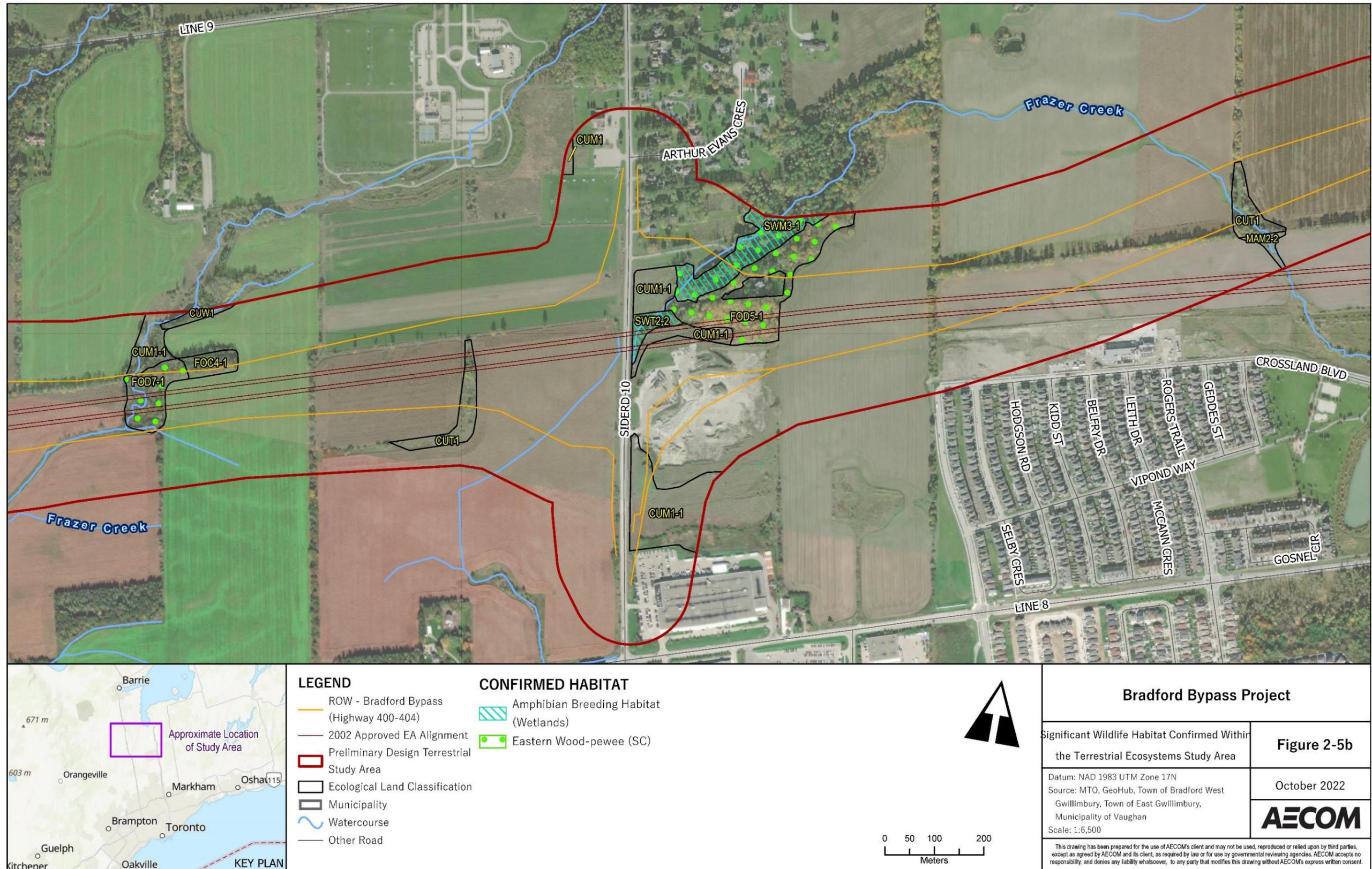


Figure 2-5b: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area



Bradford Bypass Project	
Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area	Figure 2-5b
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan Scale: 1:6,500	
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Figure 2-5c: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area

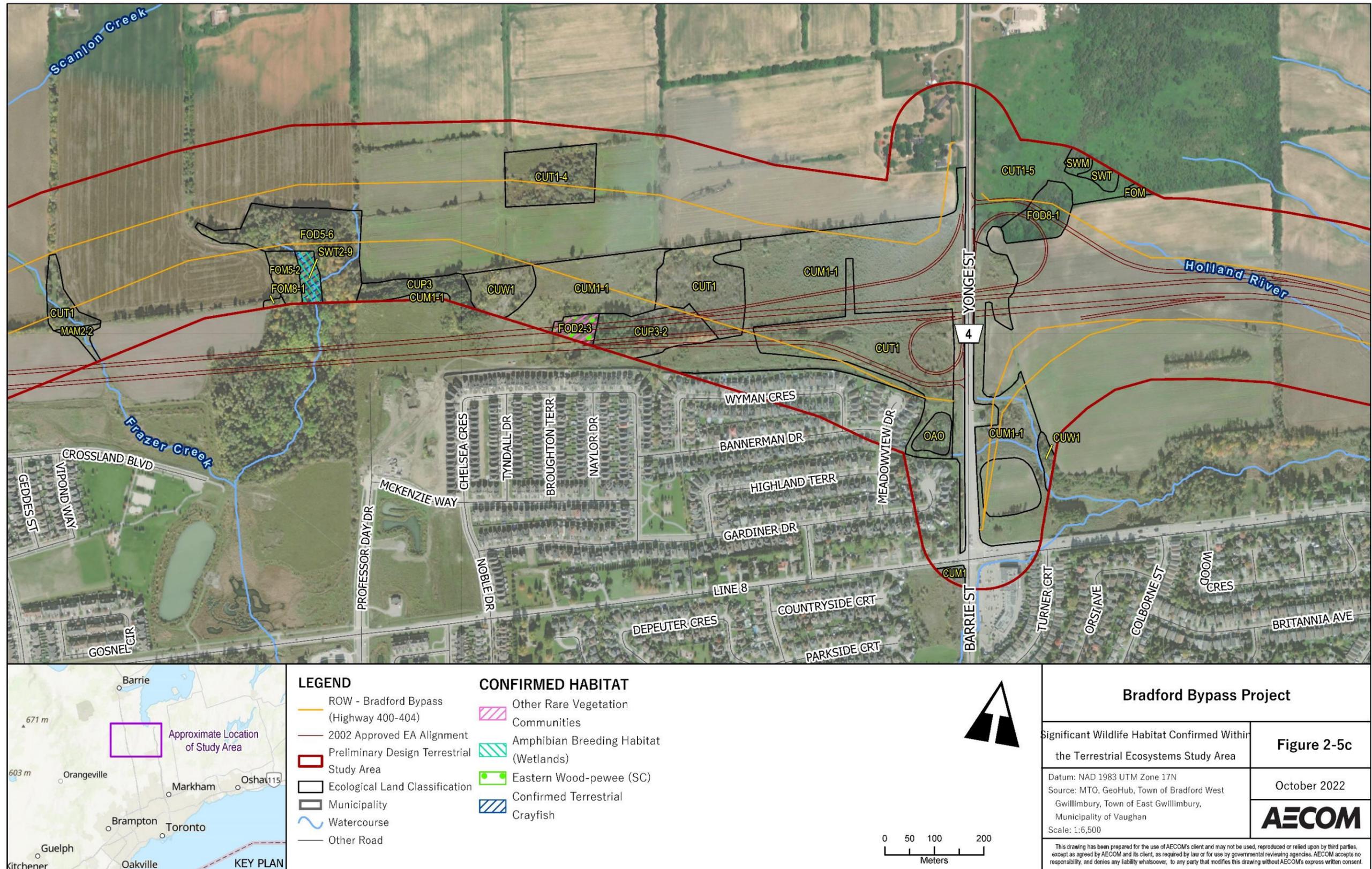


Figure 2-5d: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area

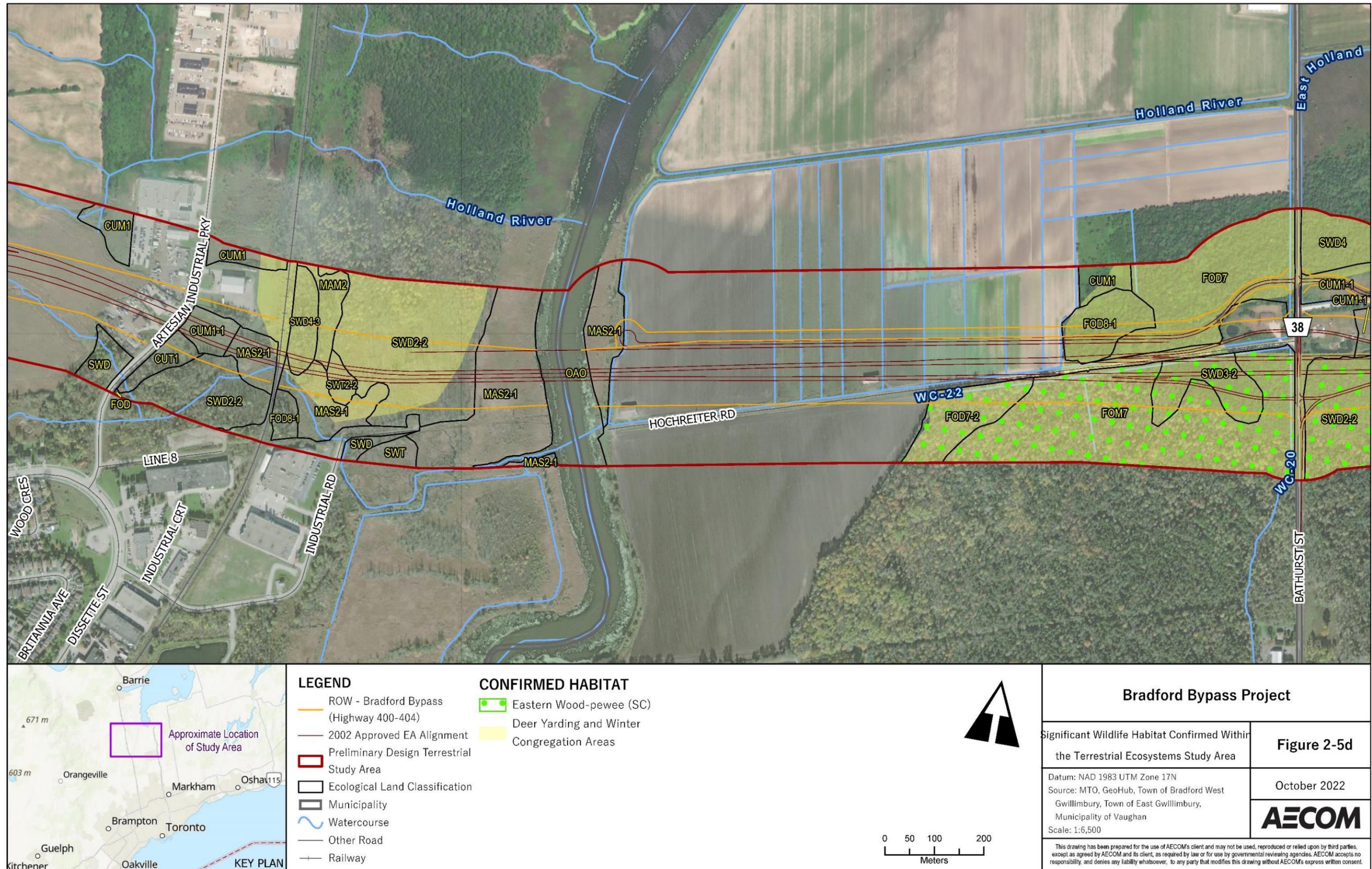
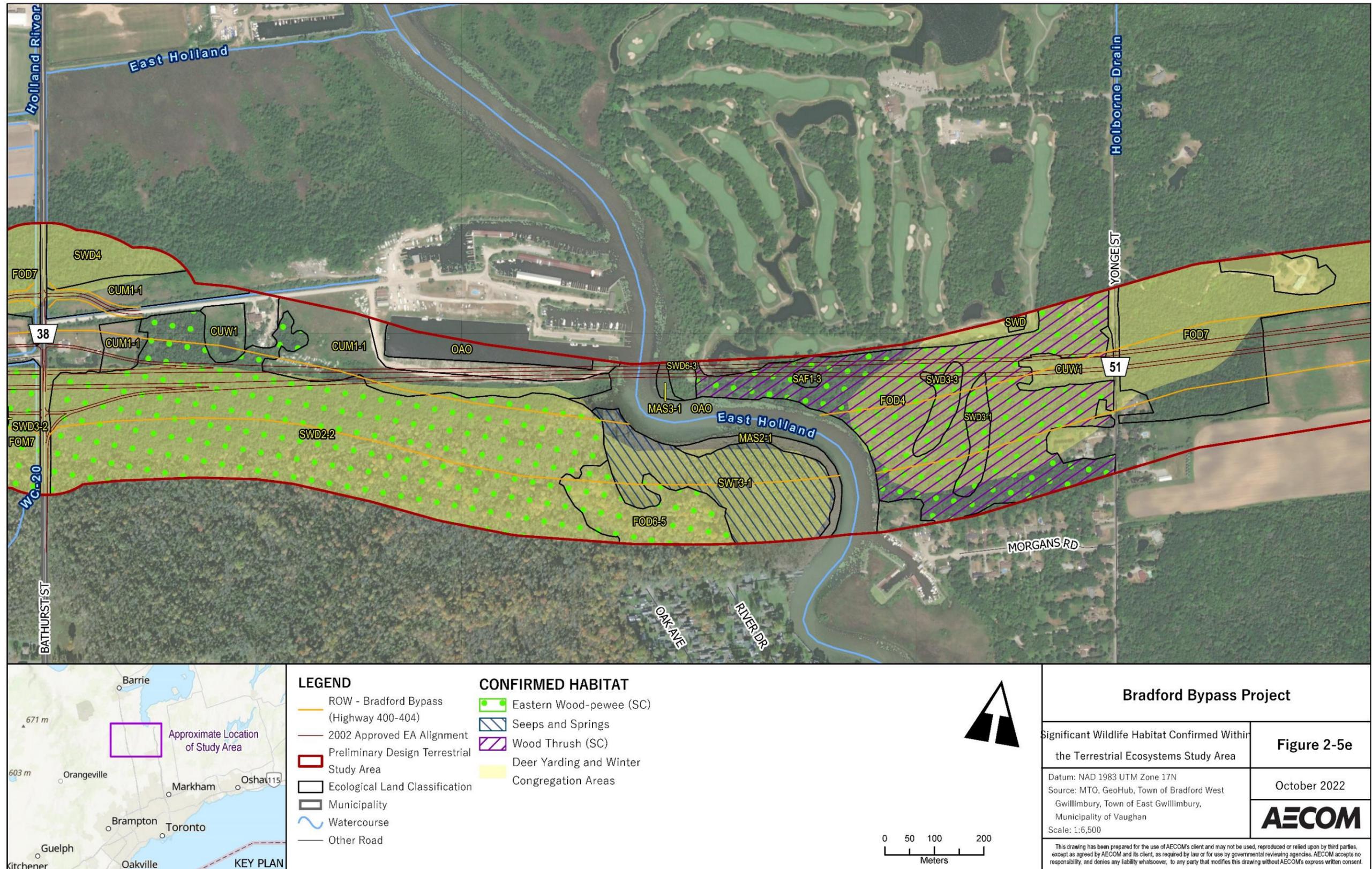


Figure 2-5e: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area



Bradford Bypass Project	
Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area	Figure 2-5e
Datum: NAD 1983 UTM Zone 17N Source: MTO, GeoHub, Town of Bradford West Gwillimbury, Town of East Gwillimbury, Municipality of Vaughan Scale: 1:6,500	
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Figure 2-5f: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area

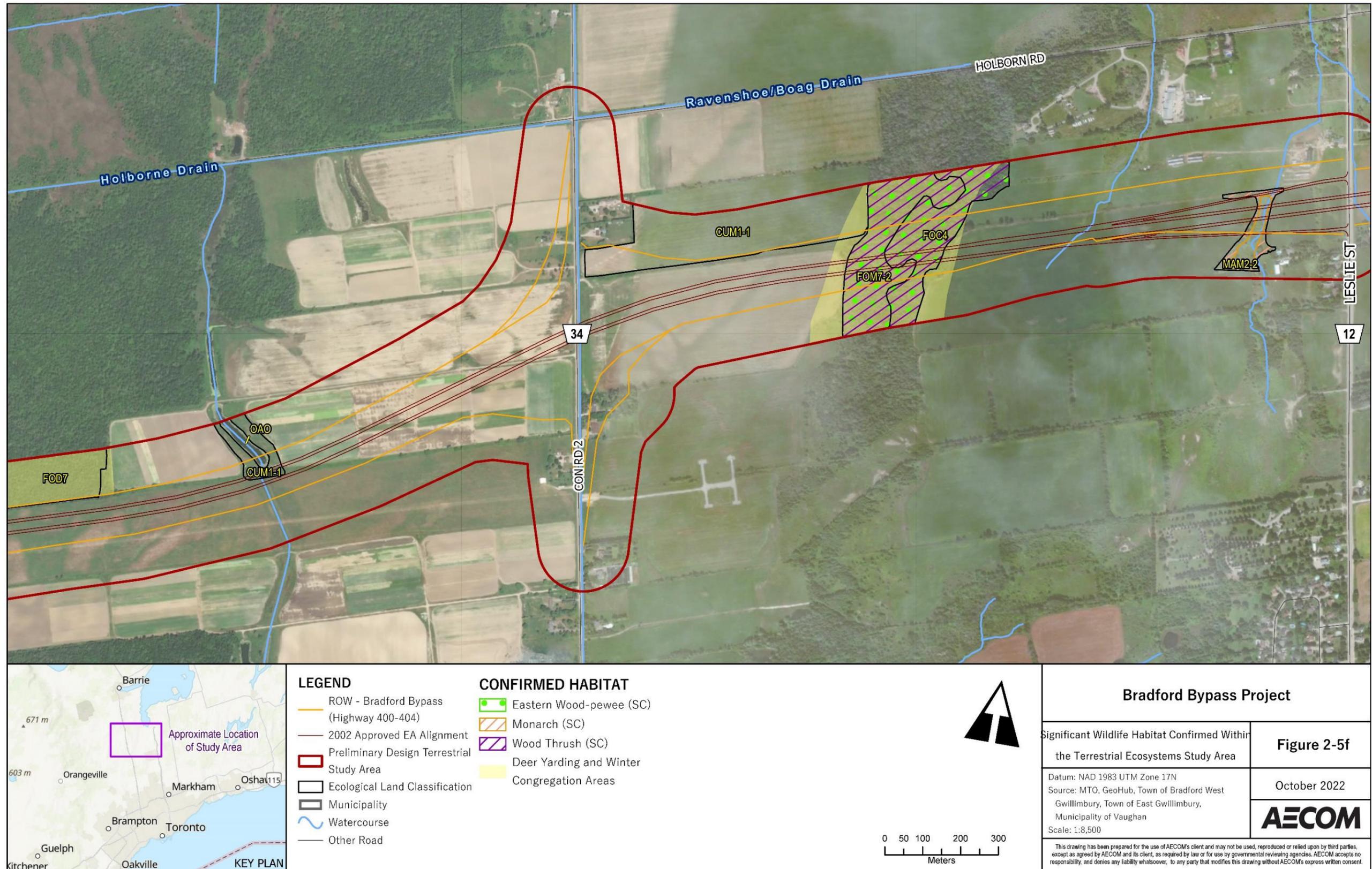
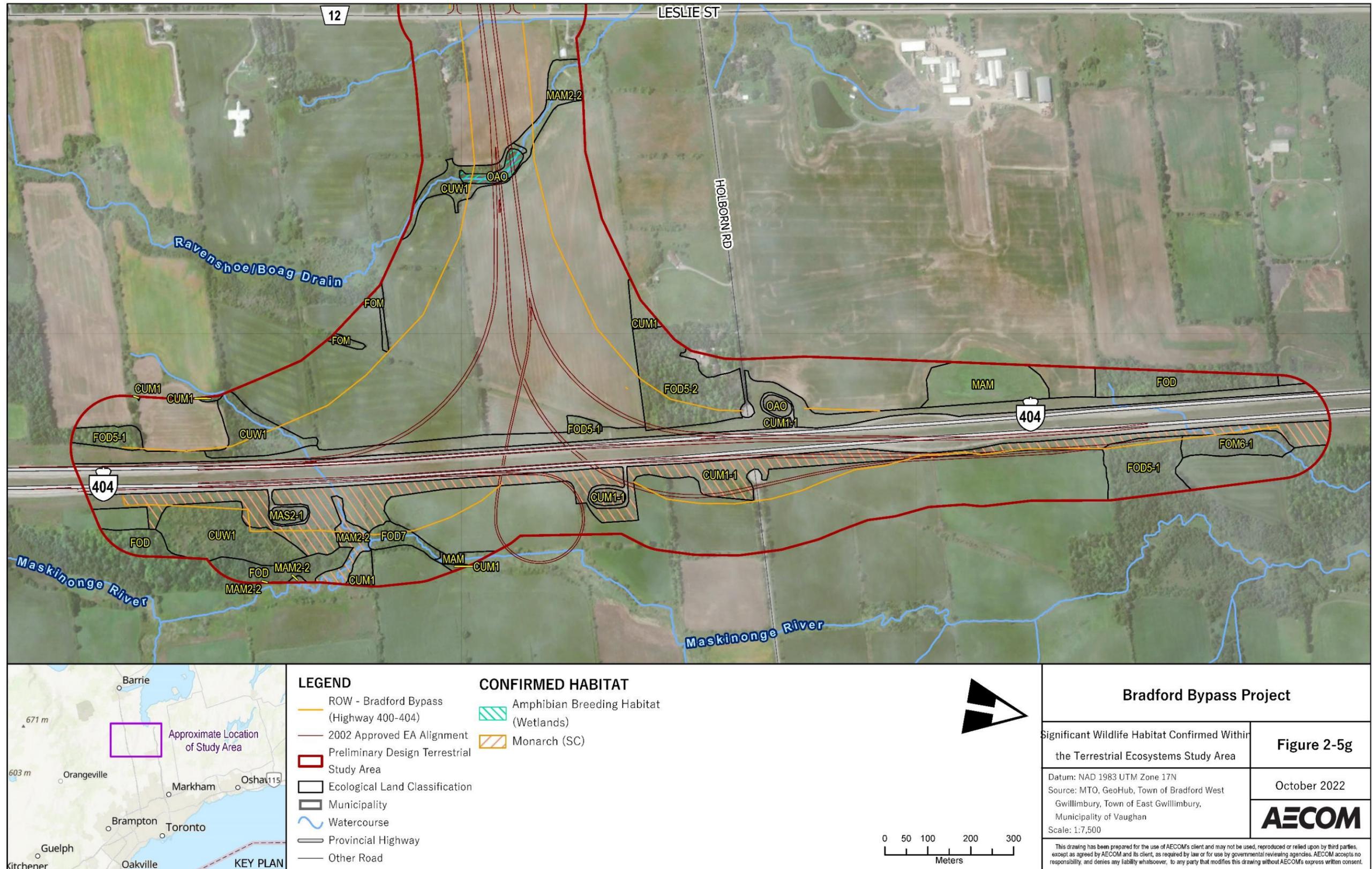


Figure 2-5g: Significant Wildlife Habitat Confirmed Within the Terrestrial Ecosystems Study Area



2.1.2 Fish and Fish Habitat

The fisheries study examines the fish and fish habitat within the Fish and Fish Habitat Study Area, with a focus on where watercourses and waterbodies intersect with the project. The Fisheries information was updated in 2019 and continues to be updated through the current Preliminary Design.

The following sections outline the background, data collection and describe the existing environmental conditions within the Fish and Fish Habitat Study Area.

2.1.2.1 Background

The 2002 Approved Environmental Assessment included a detailed description of fish and fish habitat environmental conditions and commitments that were carried forward and considered in later stages as project planning progresses.

As part of the preparatory work for the re-initiation of the Bradford Bypass in 2020, AECOM conducted a Fish and Fish Habitat Existing Conditions Report (AECOM, 2020, under separate cover), which provided a description of existing fish and fish habitat environmental conditions, summarized below:

- The Study Area falls within the Nottawasaga Valley Watershed and Lake Simcoe Watershed, and the Innisfil Creek Subwatershed
- 27 watercourse crossings and eight waterbodies are within the Study Area
- Coolwater and warmwater fish habitats were identified in the Study Area
- An occurrence of the American Eel was identified in the Holland River.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with fish and fish habitat including applicable legislation and environmental conditions. As such, an update to the description of the environmental conditions within the Fish and Fish Habitat Study Area is included in the following sections below. The assessments of the water features described herein were conducted in accordance with the Interim Environmental Guide for Fisheries (the Guide) (Ministry of Transportation, 2020a) and the Pilot Ministry of Transportation / Fisheries and Oceans Canada /Ministry of Natural Resources and Forestry Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, Version 4 (the Protocol) (2020b). This includes a step-by-step process to identify regulatory review and/or notification requirements. Some of these steps include the following.

2.1.2.2 Data Collection

2.1.2.2.1 Desktop Review

A desktop review of all relevant and available documents was completed to obtain information on fish and fish habitat within the Fish and Fish Habitat Study Area. A review of available background information was completed using several online sources, topographic maps, aerial imagery, and other sources of natural heritage information provided by the Ontario Ministry of Natural Resources and Forestry. These resources were reviewed to obtain existing fisheries data, such as species composition, records of aquatic Species At Risk, fish sanctuaries, migration barriers, watershed and drainage systems and associated wetlands. These resources include:

- Ministry of Natural Resources and Forestry Make-a-Map: Natural Heritage Information Centre (Natural Heritage Information Centre, 2019)
- Ministry of Natural Resources and Forestry Ontario Land Information Ontario base mapping data (Ministry of Natural Resources and Forestry, 2019a)
- Aquatic resource area line segment
- Aquatic resource area polygon segment
- Watershed mapping
- Fisheries and Oceans Canada Species At Risk On-line mapping (Fisheries and Oceans Canada, 2021)
- Species At Risk in Ontario Species Range Maps (Ontario Ministry of the Environment, Conservation and Parks, 2020)
- Ministry of Natural Resources and Forestry Fish ON-Line (Ministry of Natural Resources and Forestry, 2019b; accessed October 2021)
- Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement – Second Edition (Ministry of Natural Resources and Forestry, 2010a)
- Aerial photography (Google, 2022)
- Lake Simcoe Fish Community Objectives (2011)
- West Holland River Subwatershed Management Plan (Lake Simcoe Region Conservation Authority, 2010)
- The East Holland River Subwatershed Management Plan (Lake Simcoe Region Conservation Authority, 2010)
- Maskinonge River Subwatershed Plan (Lake Simcoe Region Conservation Authority, 2010)

- Innisfil Creek Subwatershed Health Check (Nottawasaga Valley Conservation Authority, 2013)
- Ministry of Natural Resources and Forestry Fish ON-Line, (Ministry of Natural Resources and Forestry, 2019)
- Fisheries and Oceans Canada Species at Risk On-line mapping (Fisheries and Oceans Canada, 2019).

Information request letters were submitted on December 4, 2019, to the Midhurst and Aurora District Ministry of Natural Resources and Forestry offices, the Lake Simcoe Region Conservation Authority, the Nottawasaga Valley Conservation Authority and the Ministry of Environment, Conservation and Parks to obtain/confirm fisheries data associated with the watercourses within the Fish and Fish Habitat Study Area. The information requests included the following:

- Watercourse names and crossing locations
- Watercourse classifications
- Habitat information/location
- Fish community data
- Absence / presence of any vulnerable species and/or critical habitat
- In-water work timing window
- Ministry of Natural Resources and Forestry management objectives
- Groundwater discharge areas
- Benthic invertebrate data.

A similar request was submitted to the Ministry of Environment, Conservation and Parks with regard to confirming the presence/absence of any aquatic Species At Risk records within the Fish and Fish Habitat Study Area. Specific correspondence with Fisheries and Oceans Canada for the fisheries study was not carried out at this stage of the project; however, Fisheries and Oceans Canada's online aquatic Species At Risk mapping has been reviewed, and Fisheries and Oceans Canada has participated in an agency consultation meeting on March 9, 2021, to discuss constraints and considerations for the Holland River and Holland River East Branch crossings. Minutes for this meeting are included in **Appendix B**.

The assessments of the water features described herein were conducted in accordance with the Interim Environmental Guide for Fisheries (the Guide) (Ministry of Transportation, 2020a) and the Pilot Ministry of Transportation / Fisheries and Oceans Canada / Ministry of Natural Resources and Forestry Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, Version 4 (the Protocol)

(2020b). This includes a step-by-step process to identify regulatory review and/or notification requirements. Some of these steps include:

- Identification of the potential for the project to cause the death of fish or harmful alteration, disruption, or destruction of fish habitat, in contravention of the Fisheries Act
- Gathering of existing fish and fish habitat data and supplementing through field investigations
- Determination of the presence of aquatic Species at Risk
- Identification of potential Ministry of Transportation Best Management Practices from the Interim Environmental Guide for Fisheries – Best Management Practices Manual (Ministry of Transportation, 2020c).

2.1.2.2.2 Field Investigations

Two separate assessments (spring and summer) were completed in order to capture potential seasonal changes in habitat conditions. During the first field investigations from September 14 to 18, 2020 (i.e., the summer assessments), the watercourses were initially inspected to determine the potential to support fish during the summer season. Habitat features, barriers to fish passage, flow regime and connectivity to direct fish habitat are taken into consideration when making this determination. In accordance with the Interim Environmental Guide for Fisheries (Ministry of Transportation, 2020a), both detailed and general assessments were completed for waterbodies within the Fish and Fish Habitat Study Area where potential fish habitat was identified and where access was permitted on both publicly and privately owned land. This included documentation, photographs and site sketches of channel characteristics (morphology, mean channel dimensions, water quality parameters), general fish habitat features (i.e., substrate and aquatic vegetation composition, in-stream and riparian cover, function of habitat for fish), areas of sensitivity such as areas of erosion potential, suitable habitat to support significant fish life processes (i.e., spawning, migration, nursery habitat), suitable habitat to support aquatic Species at Risk (i.e., spawning, migration, general use, nursery, etc.), and any other notable observations relating to the aquatic environment.

A second assessment of fish habitat in the Fish and Fish Habitat Study Area was completed again during the spring field investigations over multiple days in June 2021. During the second field investigations, water features in the Fish and Fish Habitat Study Area were surveyed to confirm the assessment of the fish habitat completed in September 2020 and to document the conditions of the aquatic environment, any significant features not observed in the initial assessment, as well as any seasonal changes and/or changes by other means to the conditions observed in the initial

assessment. Field investigations were also completed in spring of 2022 (May 19 and June 9) due to changes to the Fish and Fish Habitat Study Area boundary that required further review for potential fish habitat. These areas predominately included extensions of the Fish and Fish Habitat Study Area along the Highway 400 and 404 corridors, the proposed Sideroad 10 interchange, and the proposed 2nd Concession Road interchange. Fish sampling was completed during the spring 2021 and spring 2022 field investigations at all locations where suitable or potential fish habitat was identified. Fish sampling was carried out using methods dictated by the site conditions, including a dip net, seine net, minnow traps baited with dry cat food, or backpack electrofishing. The classification of the “not fish habitat” was also based on the Ministry of Natural Resources and Forestry’s Stream Permanency Handbook, 2013. Fish collection was not completed at the Holland River East Branch or Holland River as suitable fishery information for these locations was available through the background data collection.

2.1.2.3 Description of Environmental Conditions

For the purposes of the fisheries assessment, the Fish and Fish Habitat Study Area includes water features detected through background information review and field investigations within 200 metres downstream and 50 metres upstream of the right-of-way, where Permission to Enter was granted. Additional fisheries work was and continues to be completed in 2022. The Fish and Fish Habitat Study Area falls within two watersheds, the Nottawasaga Valley Watershed, and the Lake Simcoe Watershed. Within the Nottawasaga Watershed there is one Subwatershed that intersects within the Fish and Fish Habitat Study Area, which is the Innisfil Creek Subwatershed. Penville Creek (WC-1) is the only applicable watercourse within the Innisfil Subwatershed. The remainder of the Fish and Fish Habitat Study Area falls within three subwatersheds within the Lake Simcoe Watershed: the Holland River Subwatershed, the Holland River East Subwatershed, and the Maskinonge River Subwatershed.

2.1.2.3.1 Fish Species

The Innisfil Creek subwatershed (WC-01) provides primarily warm water fish habitat, with some cool and cold water habitat in the headwaters. Penville Creek, which is associated with WC-1 crossing, is known as a headwater feature within the Fish and Fish Habitat Study Area boundaries and would be expected to have a coolwater fish community. As for the Holland River subwatershed and the Holland River East subwatershed, both systems are known to inhabit a wide array of fish species given the large range of thermal regimes and habitat quality throughout both subwatersheds. In the Holland River subwatershed, there have been 34 fish species of fish captured since 1930 (Lake Simcoe Region Conservation Authority, 2010). Cold headwater fish communities which include species such as Brook Trout (*Salvelinus fontinalis*) and

Mottled Sculpin (*Cottus bairdii*) are known to inhabit some of the watercourses, and many large river systems and/or degraded systems have more tolerant or common fish species such as Largemouth Bass (*Micropterus salmoides*) and Brown Bullhead (*Ameiurus nebulosus*). Similarly, 35 species have been captured from the Holland River East Branch since 1930 (Lake Simcoe Region Conservation Authority, 2010b) and this subwatershed exhibits the same range of cold and warmwater species as the Holland River. Typically, smaller tributaries are cool to coldwater systems which feed the warmer main branches (i.e., Holland River East Branch and Holland River). However, even though the thermal regimes may be classified as cool or coldwater, other factors influence the fish species captured in these systems such as the habitat type/quality or in-stream barriers to fish passage (Lake Simcoe Region Conservation Authority, 2010b).

From a review of background information from the Ministry of Natural Resources and Forestry resources (Land Information Ontario; NHIC Make-a-Map 2019) and agency communications, the fish species identified below in **Table 2-10** have been recorded in the specific watercourses throughout the Fish and Fish Habitat Study Area. The Fish and Fish Habitat Existing Conditions are shown on **Figure 2-6**.

Table 2-10: Fish Species Records within the Fish and Fish Habitat Study Area

Waterbody ID	Crossing ID	Highway/Road	Fish Species Identified
WC-1	C10-A-A	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-B	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-C	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-1	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-2	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-3	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1	C10-A-4	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.
WC-1b	C10-A-5	Highway 400	■ Unknown
WC-1c	C10-A-6	Highway 400	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed, White Sucker
WC-2	C10-B-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.
WC-2	C10-B-2	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.
WC-2	C10-C-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.
WC-2	C10-C-2	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.

Waterbody ID	Crossing ID	Highway/Road	Fish Species Identified
WC-3	C11-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.
WC-4	C11-A-2	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.
WC-5	C12-A-1	10 th Sideroad	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.
WC-5	C13-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.
WC-6	C14-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.
WC-7	NA	Bradford Bypass right-of-way	■ Unknown
Pond 1	NA	Bradford Bypass right-of-way	■ Unknown
WC-9	C16-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.
WC-9	C16-A-4	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.
WC-8	C16-A-2	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.
WC-8	C16-A-3	Yonge Street	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.
WC-9	CR-4	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker, Yellow Perch (record from 300 metres u/s of C16-A-1 crossing).
WC-10	C17-A-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Rock Bass, Brook Stickleback, Northern Pike, Johnny Darter/ Tessellated Darter, Pumpkinseed, Largemouth Bass, Emerald Shiner, Yellow Perch, Black Crappie, Walleye, Common Carp, Golden Shiner, Bluntnose Minnow and Spottail Shiner.
WC-11	C17-B-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch

Waterbody ID	Crossing ID	Highway/Road	Fish Species Identified
WC-12	C17-C-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-13	C17-D-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-14	C17-E-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-15	C17-F-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-16	C18-A-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-17	C18-B-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-19	C18-C-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-20	C18-D-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-22	C18-E-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-23	C18-F-1	Bathurst Street	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-23	C18-G-1	Hochreiter Road	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch
WC-24	C18-H-1	Bathurst Street	■ Unknown
WC-25	C20-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Bowfin, Common Carp, Northern Pike, Pumpkinseed, Largemouth Bass, Golden Shiner, Spottail Shiner, Black Crappie, Rock Bass, Yellow Perch and Fathead Minnow
WC-25	C20-B-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Bowfin, Common Carp, Northern Pike, Pumpkinseed, Largemouth Bass, Golden Shiner, Spottail Shiner, Black Crappie, Rock Bass, Yellow Perch and Fathead Minnow

Waterbody ID	Crossing ID	Highway/Road	Fish Species Identified
WC-26	C22-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-27	C23-A-1	2 nd Concession Road	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-28	C24-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-29	C25-A-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-30	C25-B-1	Leslie Street	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-31	C25-C-1	Bradford Bypass right-of-way	■ Ministry of Natural Resources and Forestry (2019a): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker
WC-32	C25-A-2	Highway 404	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.
WC-32	C26-A-1	Highway 404	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.
WC-33	C27-A-1	Highway 404	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.
WC-34	C28-A-1	Highway 404	■ Ministry of Natural Resources and Forestry (2019a): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.

Figure 2-6a: Fish and Fish Habitat Existing Conditions

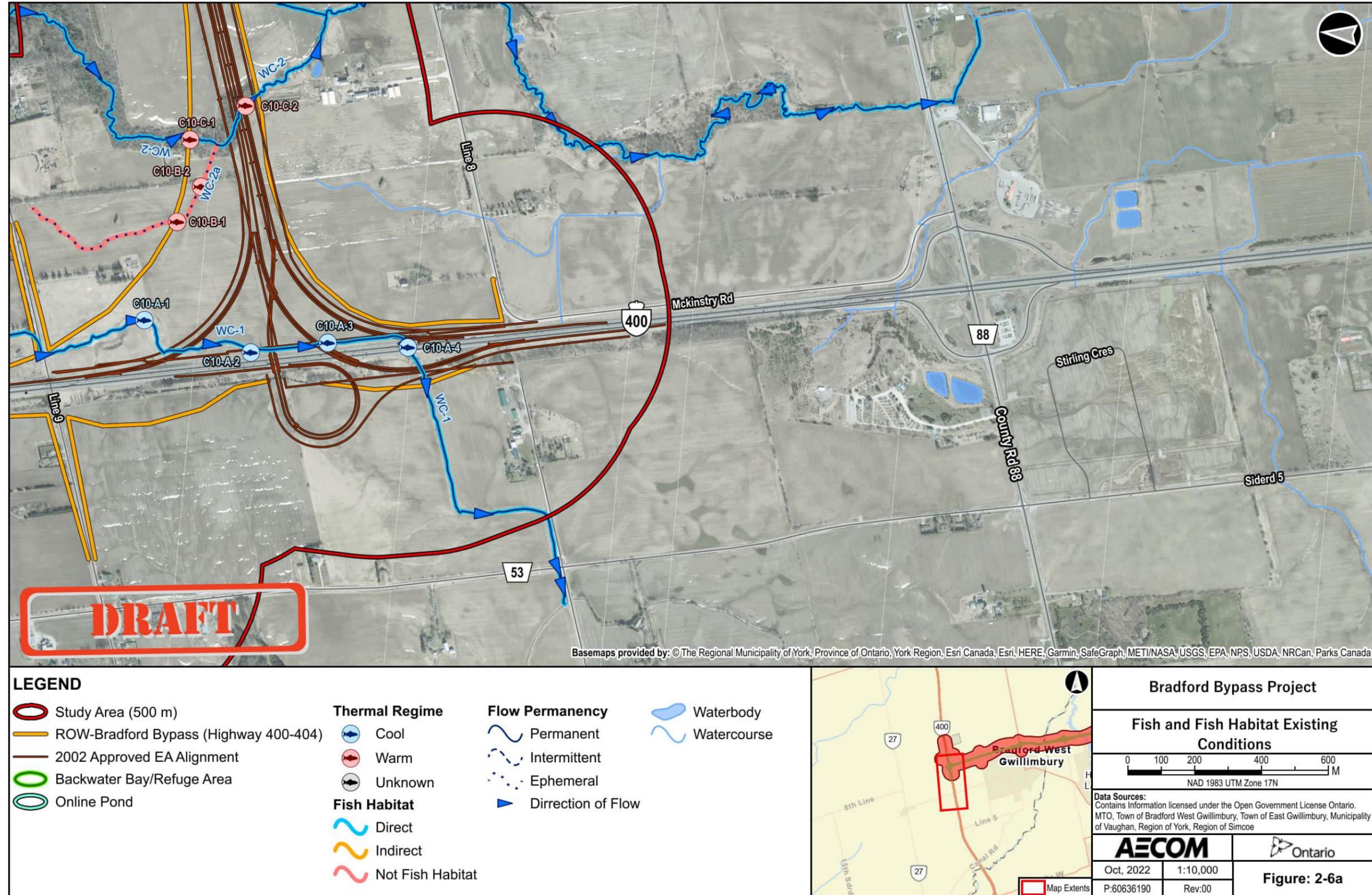


Figure 2-6b: Fish and Fish Habitat Existing Conditions

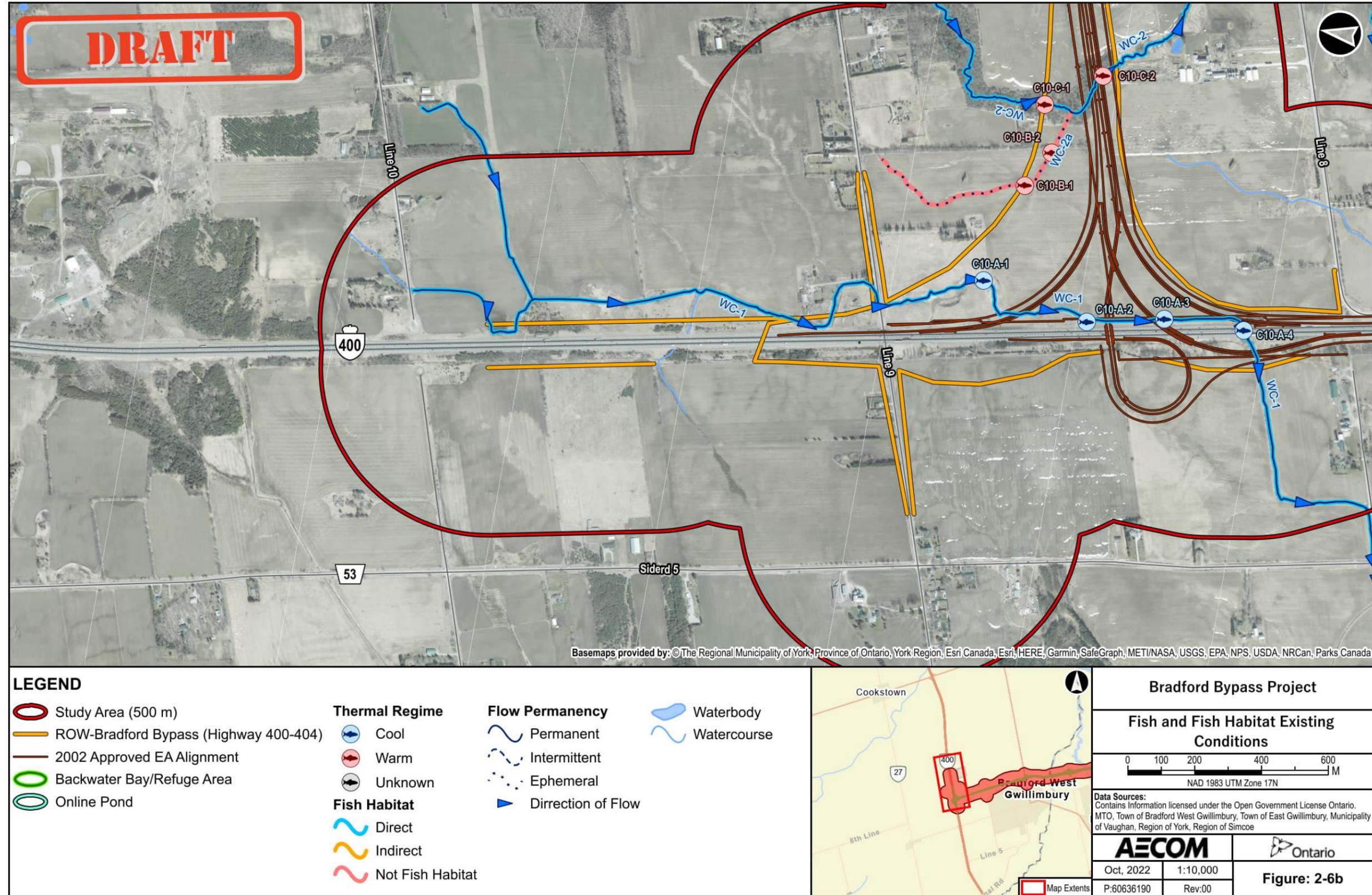


Figure 2-6c: Fish and Fish Habitat Existing Conditions

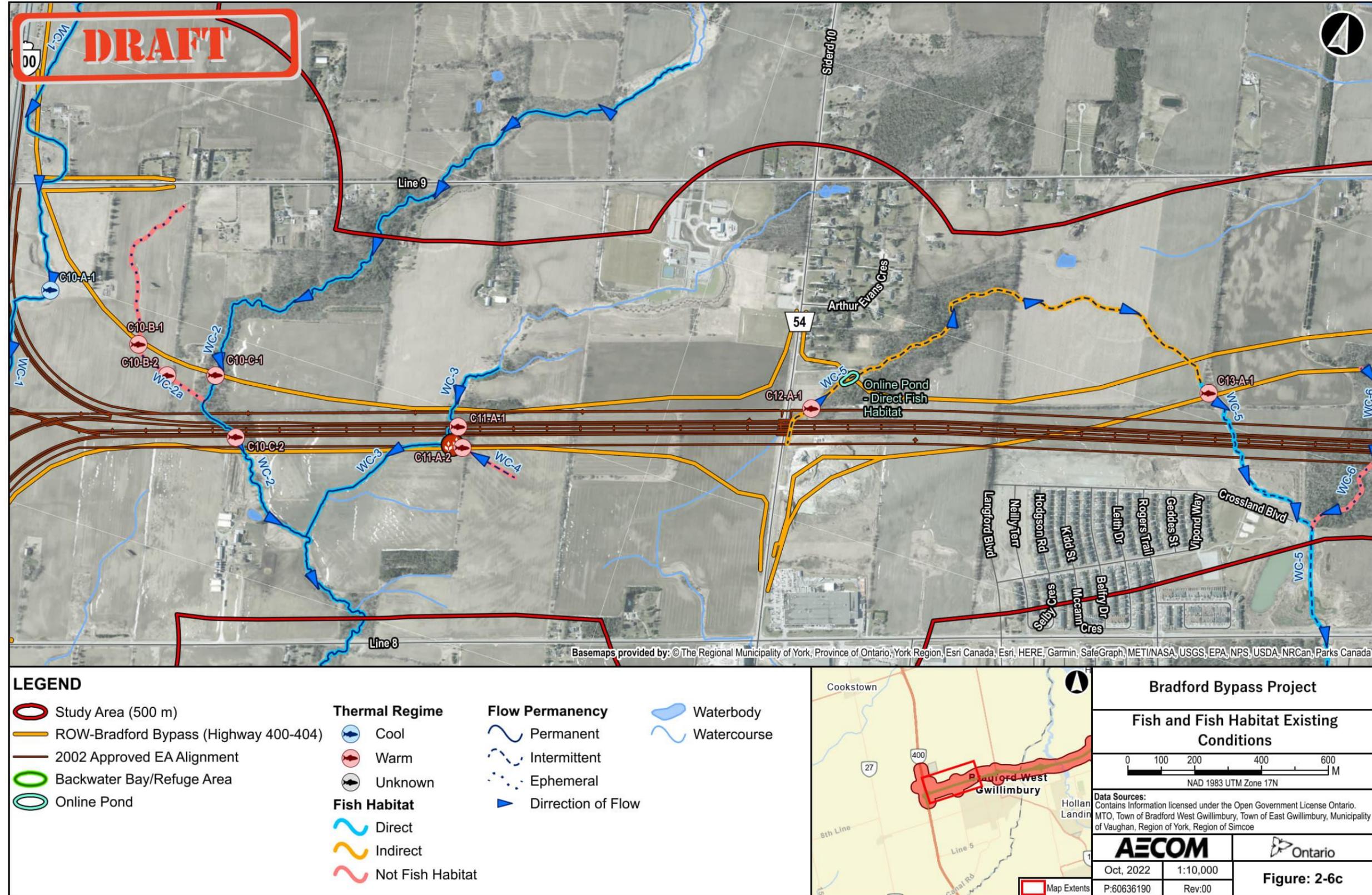


Figure 2-6d: Fish and Fish Habitat Existing Conditions

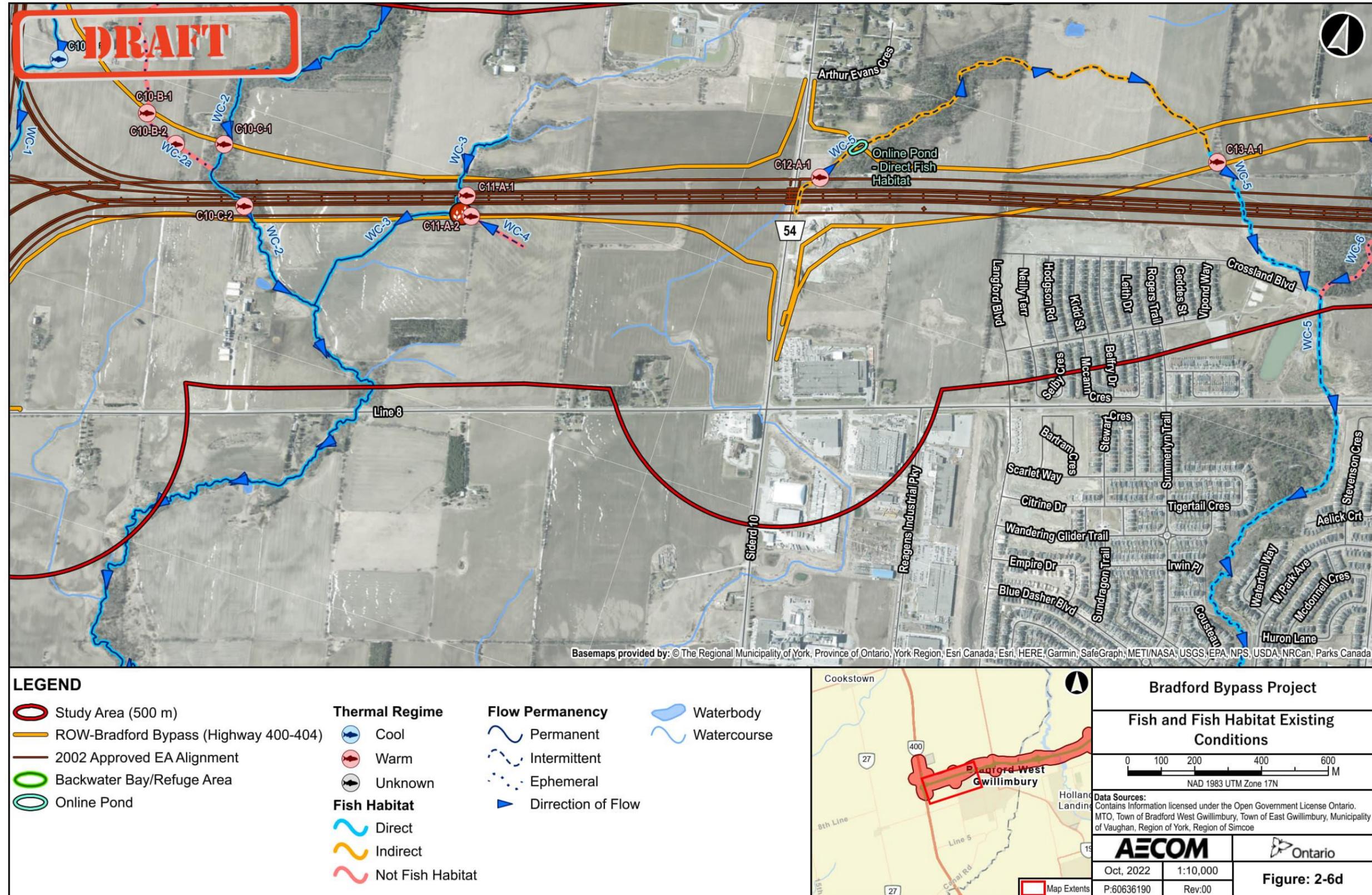


Figure 2-6e: Fish and Fish Habitat Existing Conditions

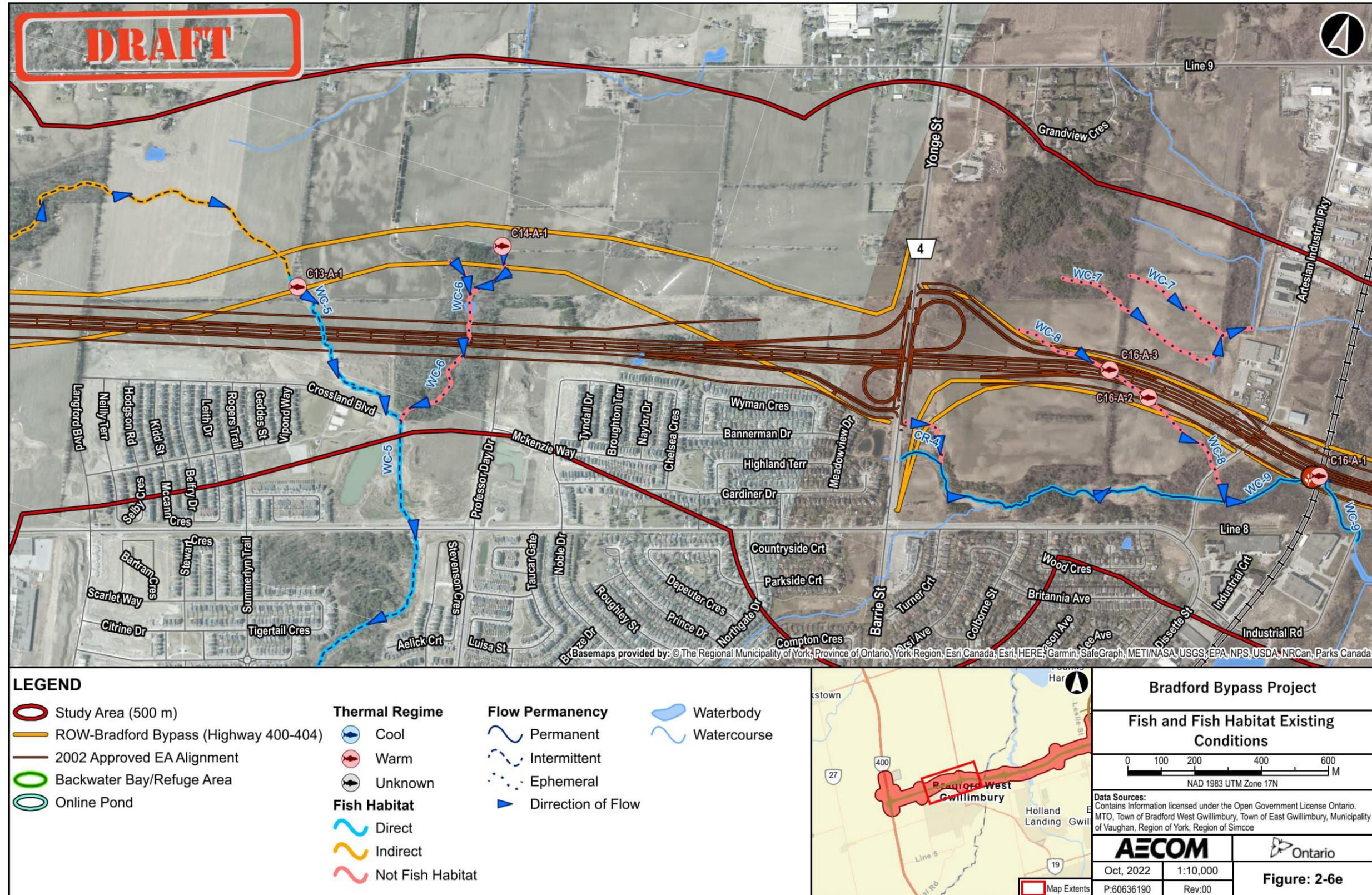


Figure 2-6f: Fish and Fish Habitat Existing Conditions

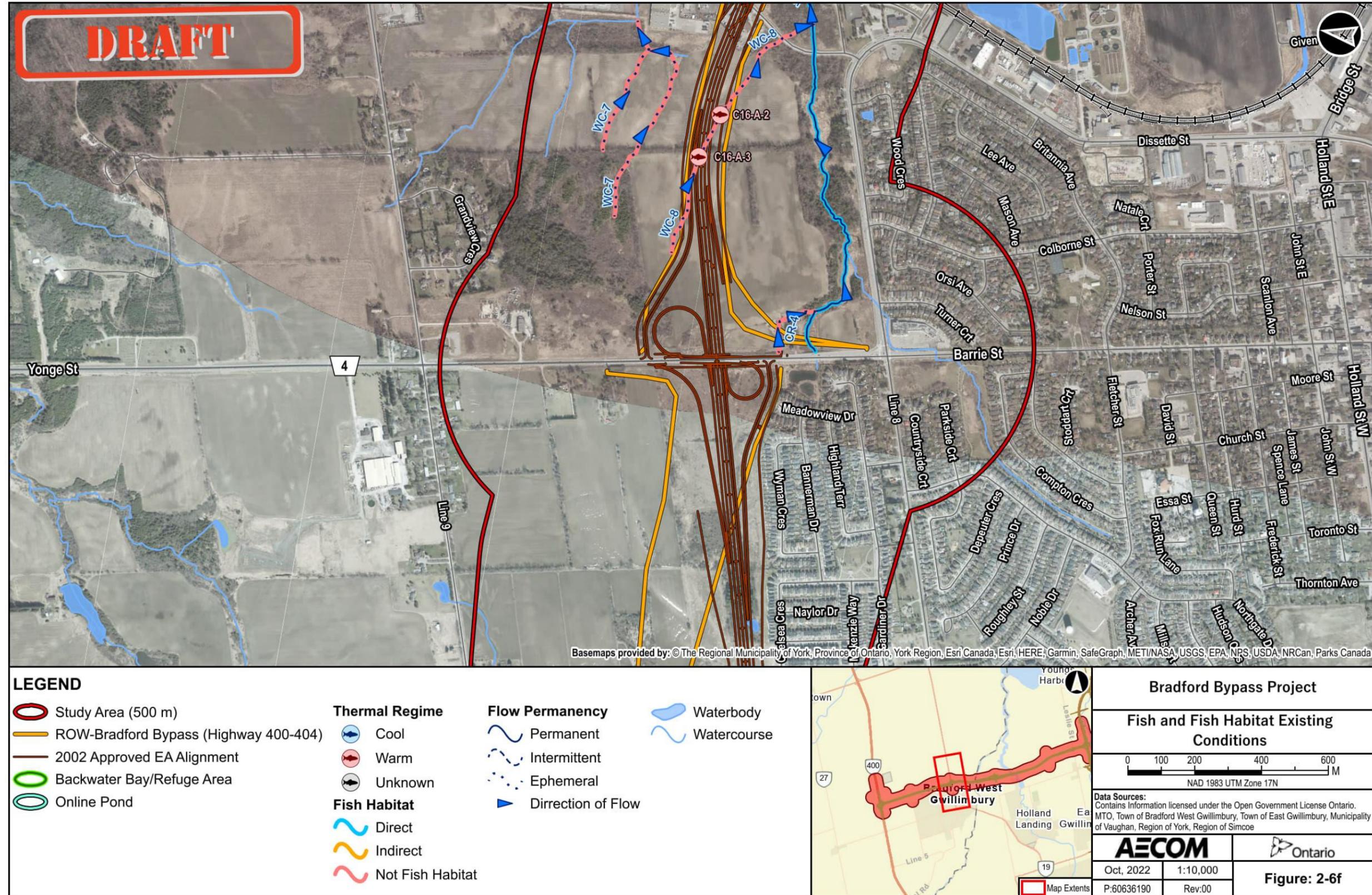


Figure 2-6g: Fish and Fish Habitat Existing Conditions

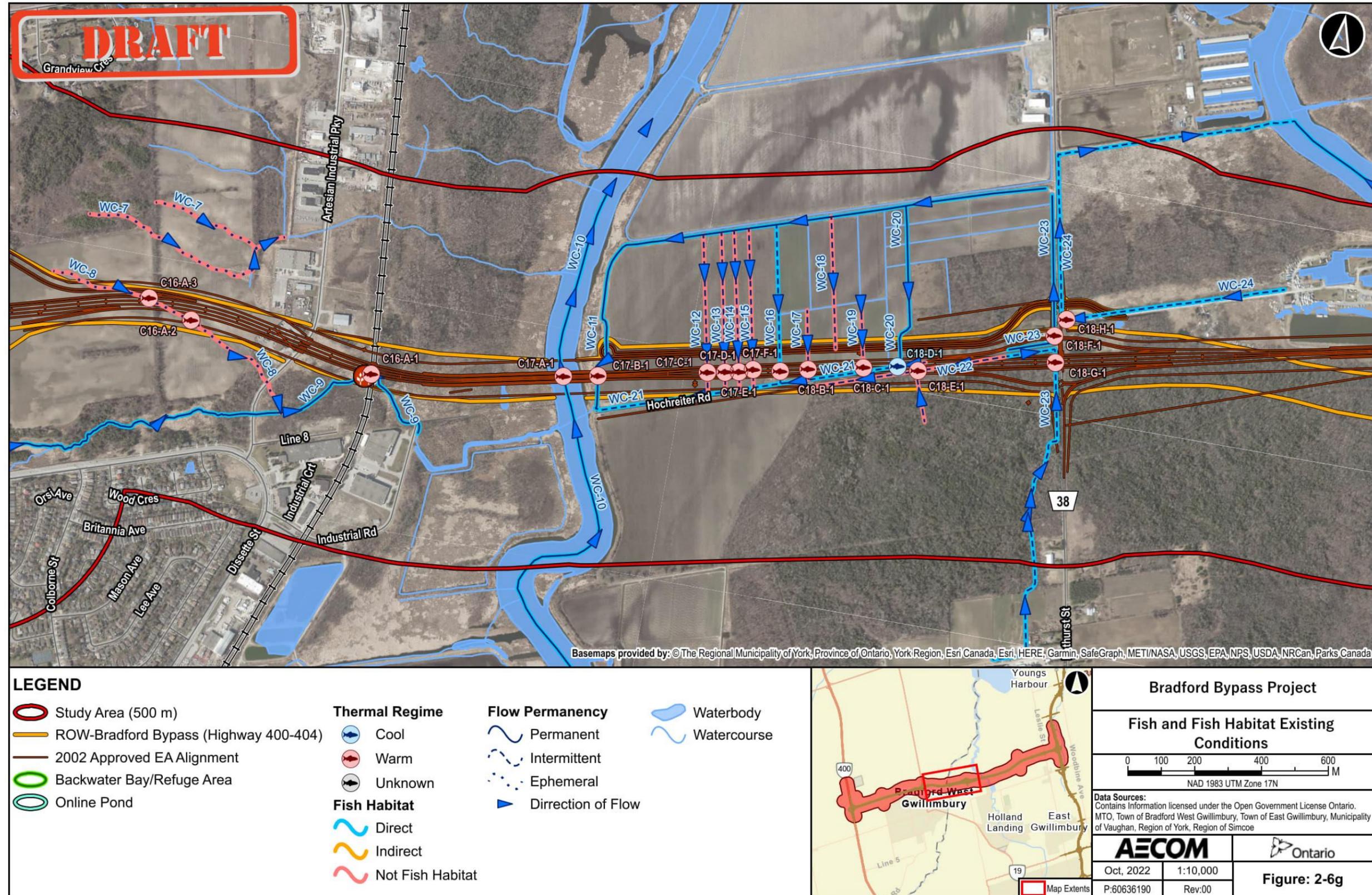


Figure 2-6h: Fish and Fish Habitat Existing Conditions

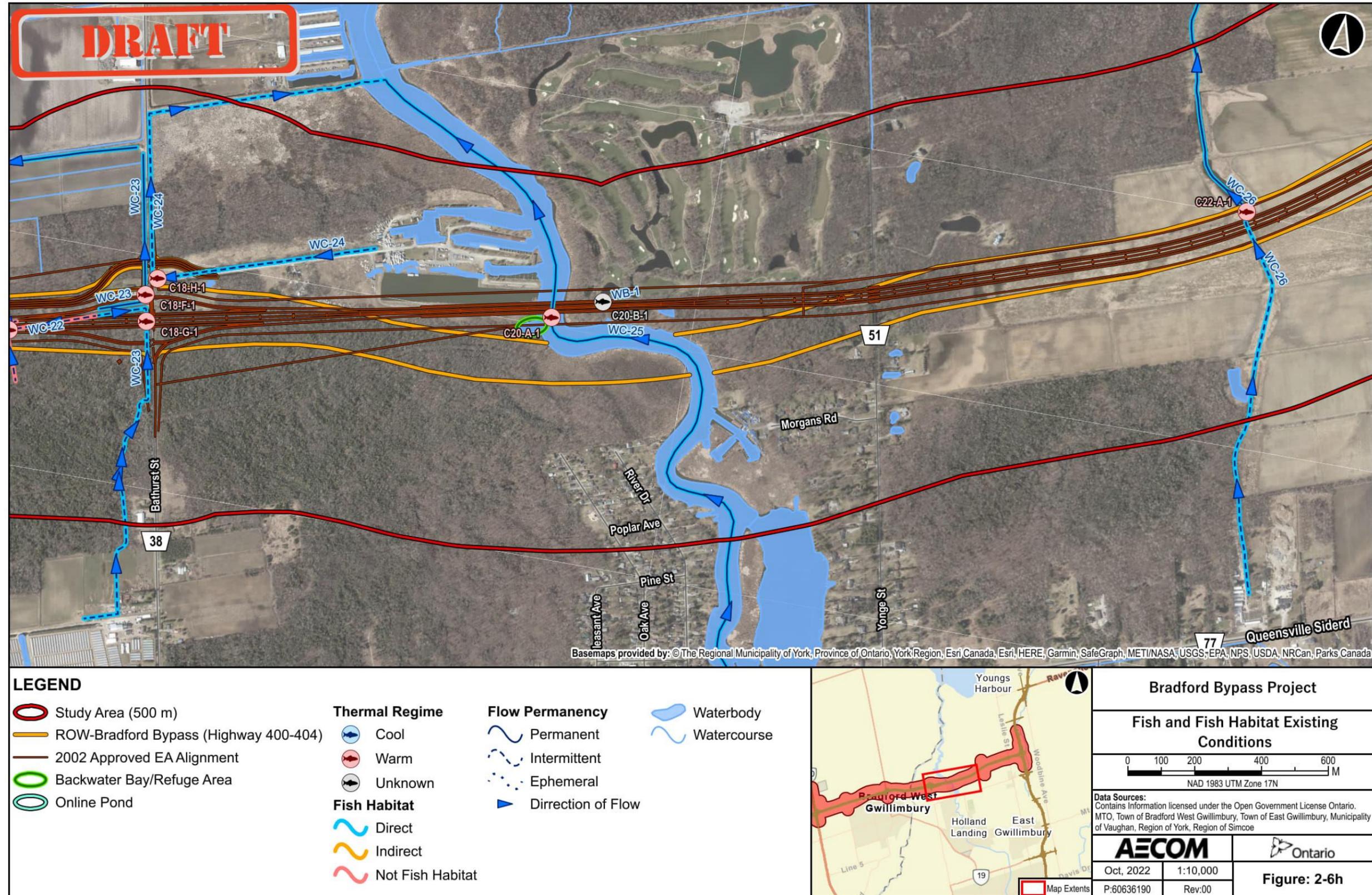


Figure 2-6i: Fish and Fish Habitat Existing Conditions

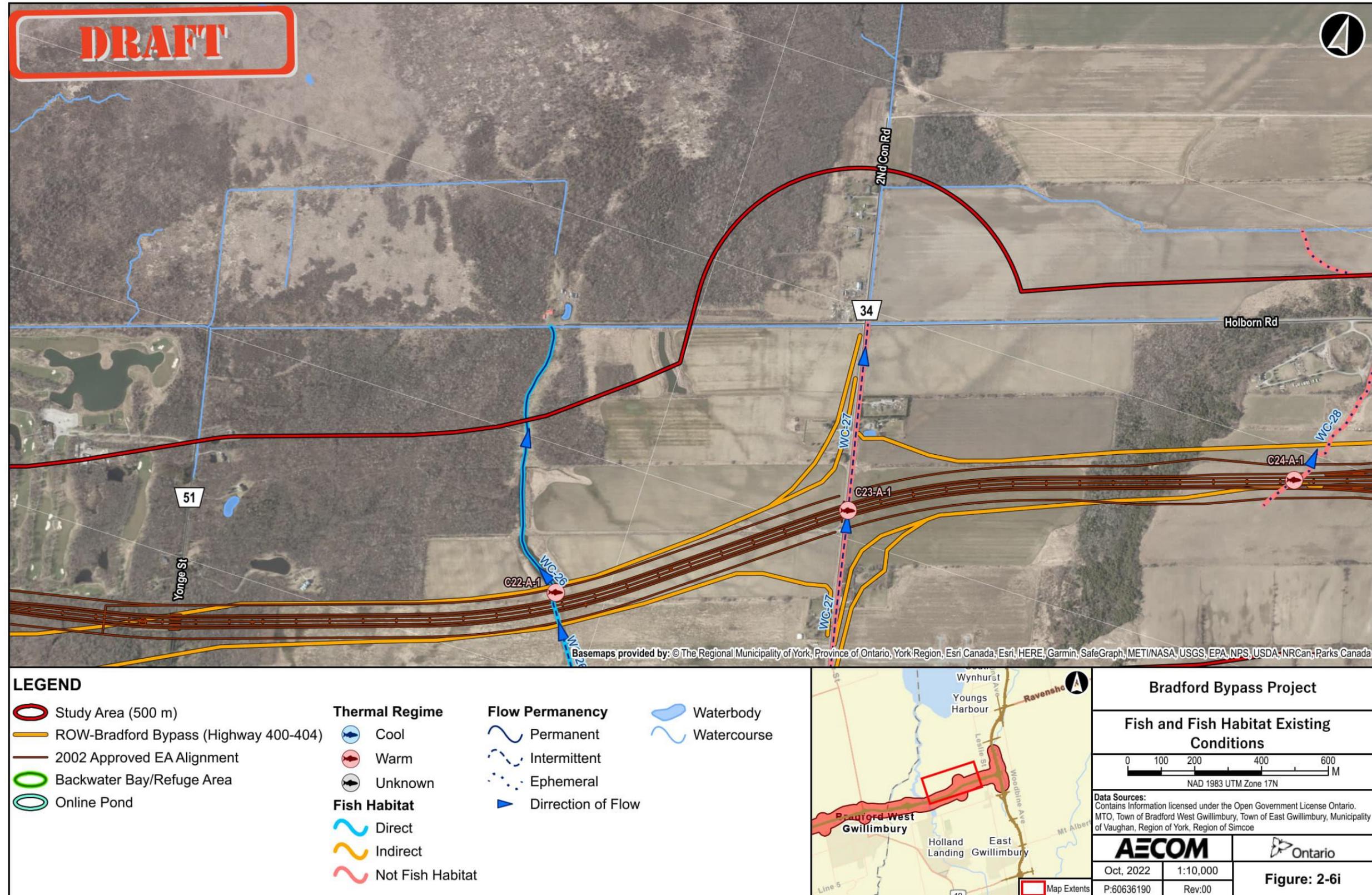


Figure 2-6j: Fish and Fish Habitat Existing Conditions

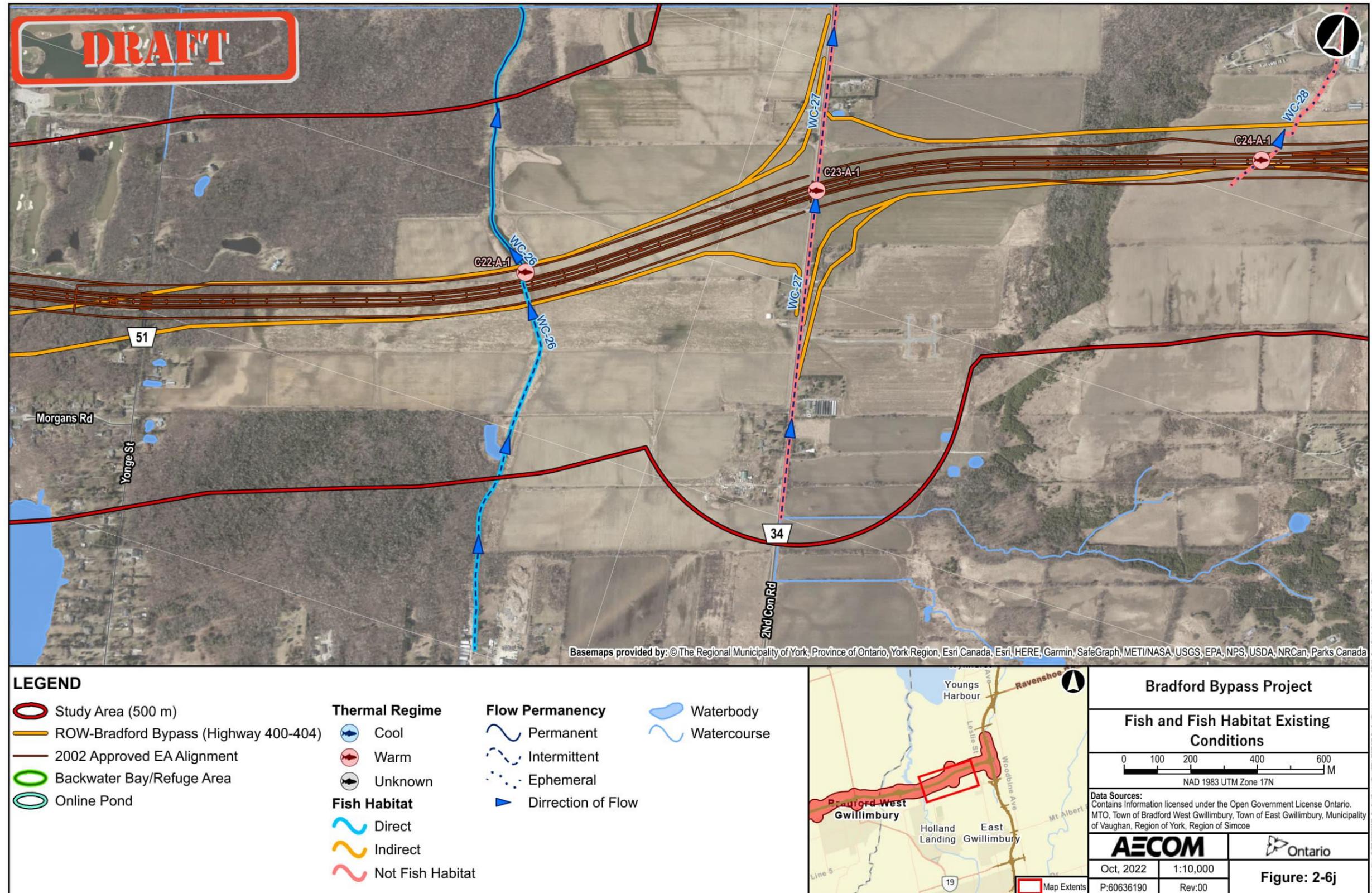


Figure 2-6k: Fish and Fish Habitat Existing Conditions

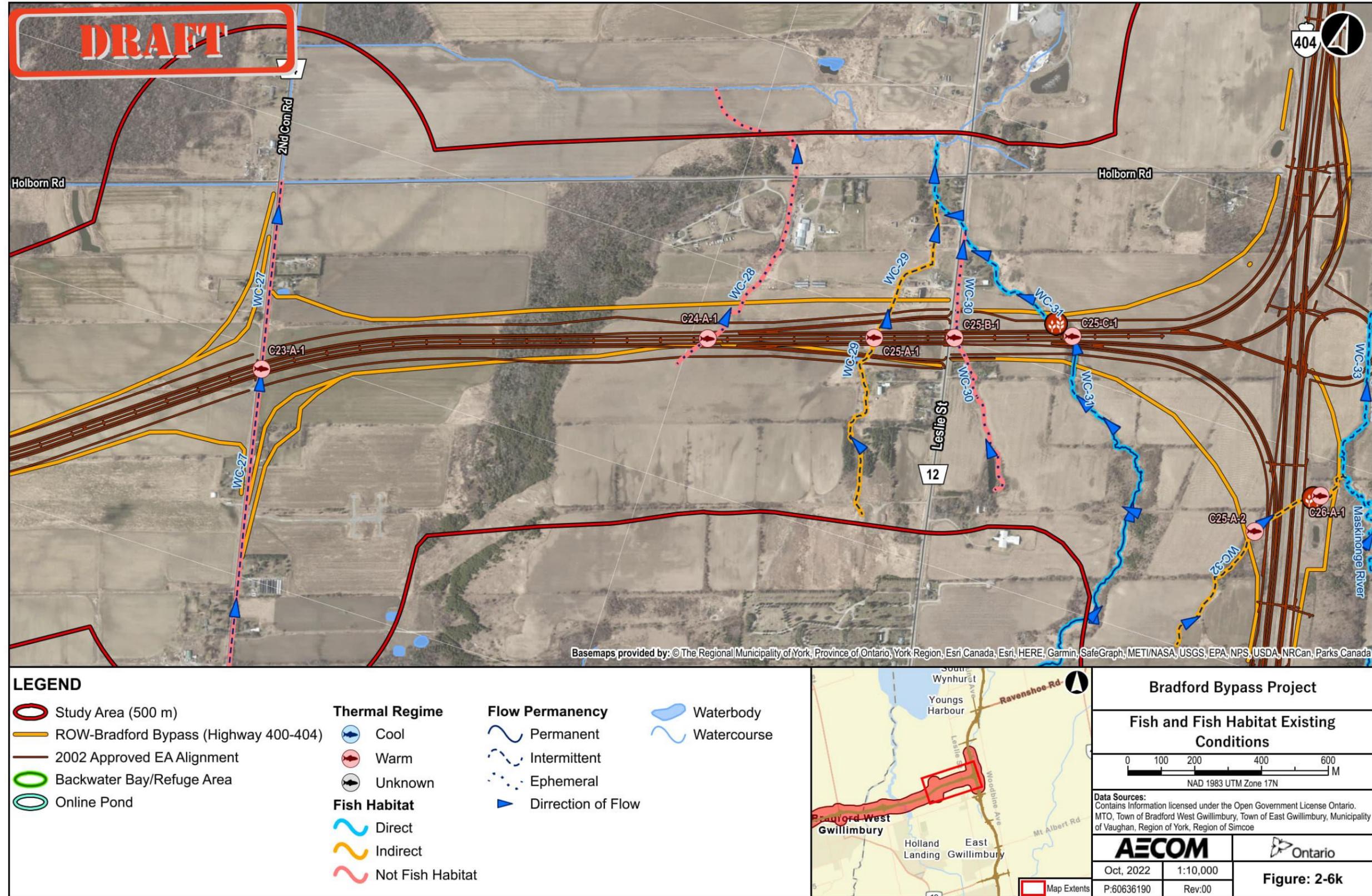


Figure 2-6I: Fish and Fish Habitat Existing Conditions

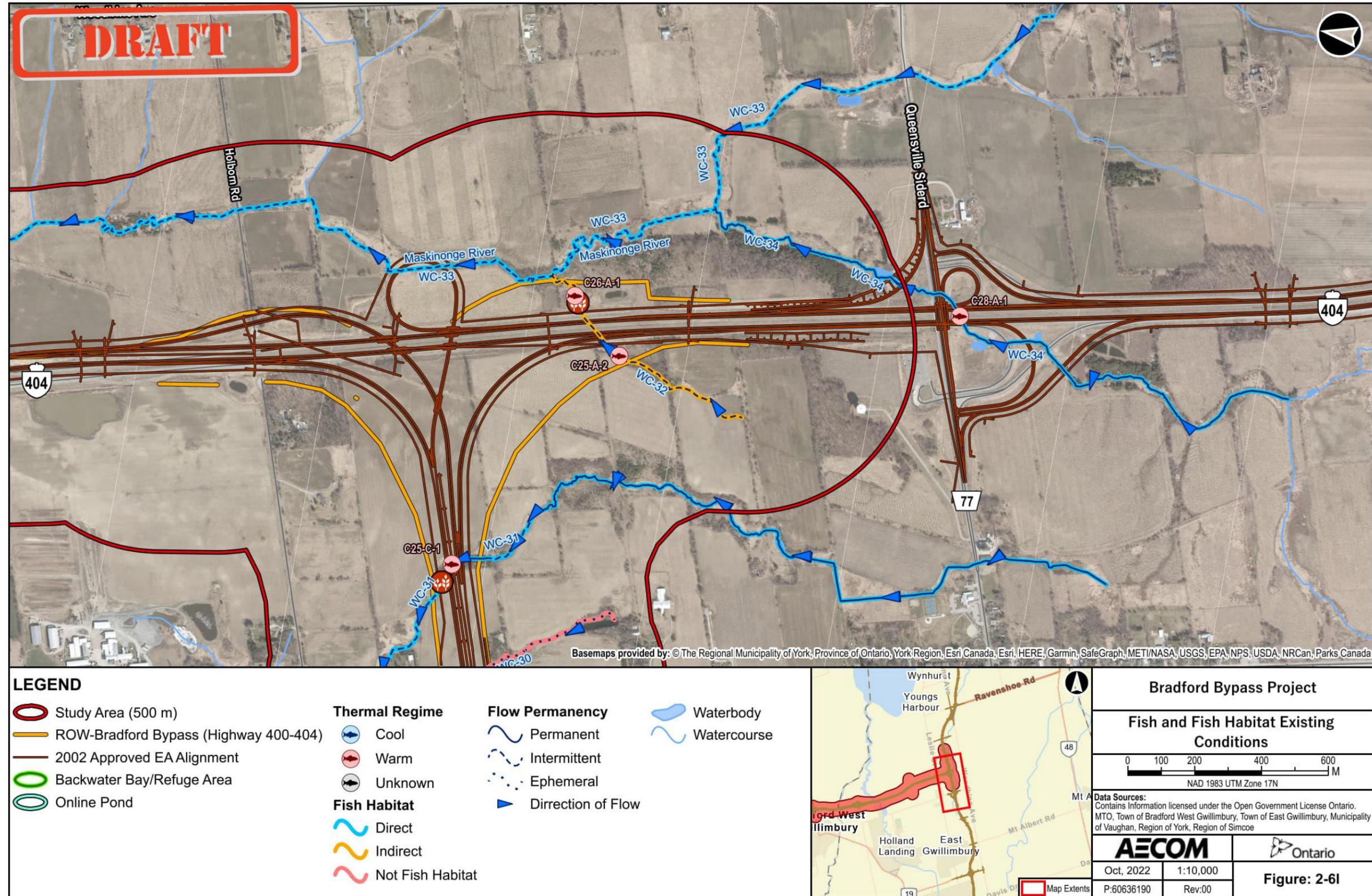
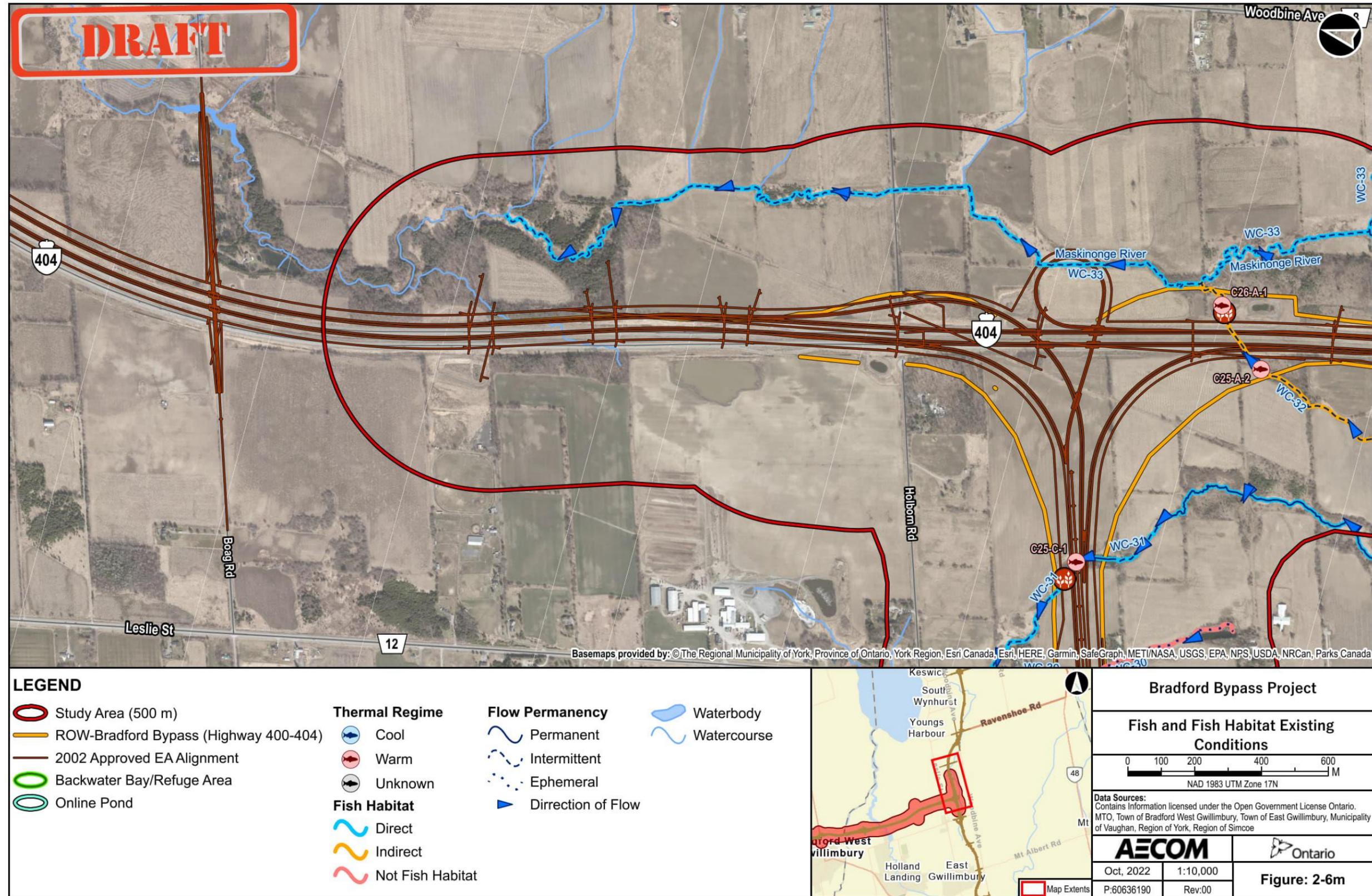


Figure 2-6m: Fish and Fish Habitat Existing Conditions



2.1.2.3.2 Aquatic Species at Risk

Under the Ontario Endangered Species Act and the federal Species at Risk Act, only species listed as Threatened and Endangered receive individual and habitat protection. For the purposes of this Report, these species will be considered Species at Risk. It is important to note that any Special Concern species potentially present within the Fish and Fish Habitat Study Area may be uplisted to Threatened or Endangered during the lifetime of the project. Should this occur, relevant federal and provincial government agencies should be consulted immediately to determine how to proceed and avoid contravention of the Endangered Species Act and/or Species at Risk Act.

Redside Dace (*Clinostomus elongatus*) have been known to reside in both the Holland River East Branch and Holland River subwatersheds. However, captures of Redside Dace have only been noted in Sharon Creek, Kettleby Creek, and the 400 Creek, all of which occur outside the Fish and Fish Habitat Study Area (Lake Simcoe Region Conservation Authority, 2010 and Lake Simcoe Region Conservation Authority, 2010b). The only aquatic Species at Risk identified by Ministry of Environment, Conservation and Parks as potentially occurring within the Fish and Fish Habitat Study Area was American Eel (*Anguilla rostrata*). The American Eel is an endangered freshwater eel (not currently listed under the Species at Risk Act; however, it is listed provincially as Endangered under the Endangered Species Act, and federally as Threatened under the Committee on the Status of Endangered Wildlife in Canada) found in Ontario. An American Eel was captured in the North Holland Canal on a previous Ministry of Transportation project, and the North Holland Canal is connected to the Holland River (WC-10) and Holland River East Branch (WC-25) approximately 11 kilometres upstream of the Holland River crossing. Therefore, American Eel should be considered as potentially present in these two watercourses within the Fish and Fish Habitat Study Area.

2.1.2.3.3 Direct Fish Habitat Crossings

There are currently 20 structures required to cross 18 different watercourses that are characterized as direct fish habitat. Without the implementation, monitoring for effectiveness, replacement, and repair (as needed) of applicable mitigation measures, activities associated with the proposed structures and culvert crossings have the potential to contravene the Fisheries Act and Endangered Species Act (limited to WC-10 and WC-25 for American Eel [*Anguilla rostrata*], Endangered under the Endangered Species Act) by:

- Introducing deleterious substances into waterbodies (e.g., sediment, grease, fuel, oil, concrete, concrete wash, solvents, etc.)
- Increased erosion potential

- Removing / altering to in-water or overhanging structure and cover, by altering riparian habitat and vegetation, in-water woody debris, substrate, or vegetation
- Operating machinery in water or on banks
- Placing permanent or temporary material or structures in water.

It is anticipated that where feasible and practical, the proposed structures or crossings will be designed and constructed in a manner that can meet the criteria of the Best Management Practices for Clear Span Bridges (Ministry of Transportation, 2020), and can apply the mitigation measures and Ontario Provincial Specifications and Standards outlined in these Best Management Practices. Proper implementation of the Best Management Practices avoids or mitigates the risk of harm to fish or harmful alteration, disruption or destruction of fish habitat and should allow for the proposed works to avoid the need for Fisheries and Oceans Canada submission through a Request for Review. However, if the proposed crossing works can not meet the Best Management Practices criteria for a clean span bridge, further assessment will be required through the Pathways of Effects process to determine if harmful alteration, disruption, or destruction of fish habitat may occur and if Fisheries and Oceans Canada review is required. Furthermore, new structures being constructed over watercourse crossings will require Fisheries and Oceans Canada review because there is no Best Management Practices for new crossings that are not clear span structures. Therefore, should structures such as Corrugated Steel Pipe culverts, box culverts, open-bottom culverts, or arch culverts be proposed at fish habitat watercourses, a Request for Review will need to be prepared and submitted to Fisheries and Oceans Canada for review. Additionally, general mitigation measures that should be incorporated into the subsequent Detail Design plans and work plans for the fish-bearing crossings include:

- **Operational Constraints**
 - Access to waterbodies and banks shall be limited to protect riparian vegetation and to minimize bank disturbance
 - In-water work below the High Water Mark and work on watercourse banks shall be carried out during the appropriate in-water timing window.
- **Management Practices and Controls**
 - An Erosion and Sediment Control Plan shall be designed and implemented to contain/isolate exposed soils, stockpiled materials, and unstable areas in the work zone and to prevent the release of sediment to all waterbodies and ensure the work site is stabilized prior to removal of Erosion and Sediment Control (ESC) measures following construction

- Design and implement an in-water work area isolation plan to maintain clean flow around the work area at all watercourse locations where in-water work is proposed
- Design and install culverts to prevent creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible
- Where new watercourse crossings are proposed, design preference should be given first to clear-span bridges, second to open-bottom culverts, and third to closed-bottom culverts
- Any fish isolated in the work area shall be transferred (using appropriate capture, handling, and release techniques to prevent harm and minimize stress) downstream or away from the construction area. Fish screens shall be used to avoid entrainment of fish in pumps or hoses
- Design and implement a work area containment plan to isolate all above-water work to prevent the release of sediment or other contaminants to a waterbody
- Where possible, organic material barriers (i.e., fibre roll barrier, sediment log, coir rolls etc.) shall be used in the drainage ditches to mitigate sediment transport
- Dewatering operations shall be managed to prevent erosion or the release of sediment-laden water to a waterbody
- A Spills Management Plan shall be prepared and shall include materials, instructions, education, and emergency numbers
- Operate, store, and maintain equipment and associated materials in a manner and at a distance that prevents the entry of any deleterious substance from entering a waterbody.

■ **Rehabilitation**

- Re-stabilize any portion of the bed of a waterbody disturbed during construction to pre-construction conditions
- Re-stabilize the banks of a waterbody that have been disturbed during construction to pre-construction conditions or better
- Re-stabilize and re-vegetate soils exposed or disturbed during construction, including new or cleaned-out ditches.

■ **Monitoring:**

- In-water and near-water work shall be monitored to ensure mitigation measures are properly implemented, functioning, maintained, and repaired as needed, and removed following construction. The frequency

and timing of monitoring shall be determined through Detail Design and to meet the requirements of the Fisheries Act and associated approvals or authorizations.

2.1.2.3.4 Indirect and Not Fish Habitat Crossings

General measures for environmental protection (e.g., spill and sediment management) should be applied for work at structures where no fish-bearing water features were present in or near the work area. Many of these features, most notable those characterised as indirect fish habitat, still drain directly to a watercourse that provides fish habitat. Therefore, off-site drainage can still impact fish-bearing systems and cause serious harm to fish as per the Federal Fisheries Act. For this reason, the crossing locations characterized as indirect fish habitat still have in-water work timing windows associated with them. Similar to direct fish habitat crossings, indirect/not fish habitat crossings should have site-specific ESC plans designed and implemented to contain/isolate exposed soils, stockpiled materials, and unstable areas in the work zone.

2.1.2.3.5 Summary

Each of the proposed watercourse crossing locations within the Fish and Fish Habitat Study Area were assessed through background data review, agency correspondence and field investigations in accordance with the Environmental Guide for Fish and Fish Habitat. This assessment served to describe the existing conditions of fish and fish habitat and will serve to inform the impact assessment of the proposed work. A draft detailed description of the existing aquatic conditions documented during the field investigations and summary of the existing fish habitat conditions at each crossing is presented in **Appendix A**. The information provided will be updated as Preliminary Design progresses.

Currently, the proposed route location consists of a mixture of farmland, natural areas, and rural properties that will be impacted to various degrees depending on the preferred alternative. At this stage of the design, the structure types and building methods are still unknown, but there will be multiple bridge and culvert structures required to cross the numerous small and large watercourse systems. There are currently 20 structures required to cross 18 different watercourses systems that are characterized as direct fish habitat. All watercourses with fish habitat present within the Fish and Fish Habitat Study Area have been characterized as warmwater fish habitat, aside from Pennville Creek which was characterized as coolwater fish habitat (WC1). Three of these locations have fish habitat present that would be considered significant: WC7 – Tributary to Holland River – 1, WC8 –Holland River, and WC 21 –Holland River East. In addition, there are 22 drainage features that were characterized as indirect fish habitat or not fish habitat that may still have drainage requirements to convey flow to downstream systems.

Lastly, there were two ponds identified in the Ministry right-of-way: 1 offline pond (C20-B-1) and one online pond (C25-C-1). At this time, the need for channel realignments is not known. Once design alternatives have been determined, further review of the potential impacts will need to be completed.

The potential for American Eel (Endangered) to be present in the Holland River (WC-10) and Holland River East Branch (WC-25) will require further review once the design process has advanced. Further discussions with Ministry of Natural Resources and Forestry and Ministry of the Environment, Conservation and Parks are recommended during the Detail Design stage to determine approvals that may be required under the Endangered Species Act.

Due to the warm/coolwater designation for all the fish-bearing watercourses identified in the Fish and Fish Habitat Study Area, the in-water work timing window (when work can occur) for direct and indirect watercourse locations is from **July 16 to March 14** of any year. No records of fall-spawning species were retrieved from background data collection or observed during field investigations for all other watercourse features.

The impact assessment (to follow under separate cover) conducted by certified Fisheries Assessment Specialists will assess in detail the potential impacts to fish and fish habitat based on the Preliminary Design, provide the mitigation measures and Ontario Provincial Standard Specifications required to avoid or mitigate the risk of harm, and identify the appropriate steps of the Fisheries Protocol (2020) applicable to the project and associated notification, assessment or regulatory review required.

2.1.3 Stormwater and Drainage

The following sections outline the background, data collection and describe the existing environmental conditions within the Stormwater and Drainage Study Area, with a focus on drainage patterns, drainage infrastructure and catchment areas.

2.1.3.1 Background

The 2002 Approved Environmental Assessment included a high-level drainage and surface water assessment, description of existing drainage conditions within the Study Area, and made recommendations for mitigation should surface water resources be impacted during further design or construction.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with drainage including applicable legislation and environmental conditions. As such, an update to the description of the environmental conditions within the Stormwater and Drainage Study Area is included in the following sections below.

2.1.3.2 Data Collection

A drainage and stormwater management preliminary assessment and analysis was completed in accordance with the Ministry of Transportation Highway Drainage Design Standards (Ministry of Transportation, 2008). The objectives of the drainage and stormwater management assessment were to:

- Establish existing drainage patterns across the Stormwater and Drainage Study Area by reviewing contract drawings, previous drainage studies, aerial photos, and topographic data
- Complete site investigation to observe and document drainage infrastructure characteristics and conditions as well as any areas of concern (flooding issues, erosions and/or scour locations, etc.)
- Delineate drainage catchments and complete existing conditions hydrology analysis to determine peak flows for baseline comparison
- Complete the existing drainage conditions hydraulics assessment of culverts to establish if the Design Criteria are met
- Identify locations of proposed culverts along the Bradford Bypass mainline side roads and highway ramps
- Identify locations of potential channel / watercourse realignment and new side ditches
- Identify potential locations of Stormwater Management facilities, Stormwater Management Extended Detention ponds, Enhanced Grassed Swales and Flat Bottom Grassed Swales with flow check dams
- Complete the hydrology and hydraulics analyses and evaluation for different design stages to confirm adequacy of the modified structures and to identify potential impacts to peak flow and infrastructure
- Maintain existing drainage pattern within the Stormwater and Drainage Study Area as feasible
- Ensure positive drainage is provided for runoff generated within upstream lands – across the highway / road - to receiving water bodies.

In addition to the Ministry of Transportation Highway Drainage Design Standards, January 2008 (Ministry of Transportation, 2008), the drainage and stormwater management assessment referenced the following design guidelines:

- Ministry of Transportation Drainage Management Manual, 1997
- Ministry of Transportation Highway Drainage Design Standards, 2008

- Ministry of Transportation Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects, 2015
- Ministry of Transportation Environmental Reference for Highway Design, 2013
- Ministry of Transportation Contract Drawings, CONT No. 2021-2124
- Ministry of Transportation Gravity Pipe Design Guidelines, 2014
- Ministry of the Environment, Conservation and Parks Stormwater Management Planning and Design Manual, 2003
- Ministry of the Environment, Conservation and Parks – Ontario Regulation 697/21 made under the Environmental Assessment Act for the Bradford Bypass Project, 2021
- Lake Simcoe Region Conservation Authority Technical Guidelines for Stormwater Management Submissions, 2016
- Nottawasaga Valley Conservation Authority Stormwater Technical Guidelines, 2013
- Ontario Regulation 172/06 - Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

A field visit was undertaken in October 2020 to inspect the existing culverts and to identify related issues within the Stormwater and Drainage Study Area. An additional field visit was undertaken in August 2021 to inspect two culverts that cross County Road 4. The field visits were used to clarify the following within the existing drainage system:

- Confirm the existing direction of surface flow
- Confirm the location of culverts (sizes, material, physical conditions, outfalls etc.)
- Confirm drainage area dividers and natural flow paths
- Identify erosion sites and drainage related deficiencies.

2.1.3.3 Description of Environmental Conditions

Watercourses within the Stormwater and Drainage Study Area fall within the jurisdictions of the Nottawasaga Valley Conservation Authority (tributary of Penville Creek near Highway 400) and Lake Simcoe Region Conservation Authority (between Highway 404 and Highway 400).

2.1.3.3.1 Existing Drainage Pattern

The drainage patterns within the Stormwater and Drainage Study Area vary dramatically and are conveyed by a combination of riverine flows, tributaries, municipal drains, culvert crossings and ditches.

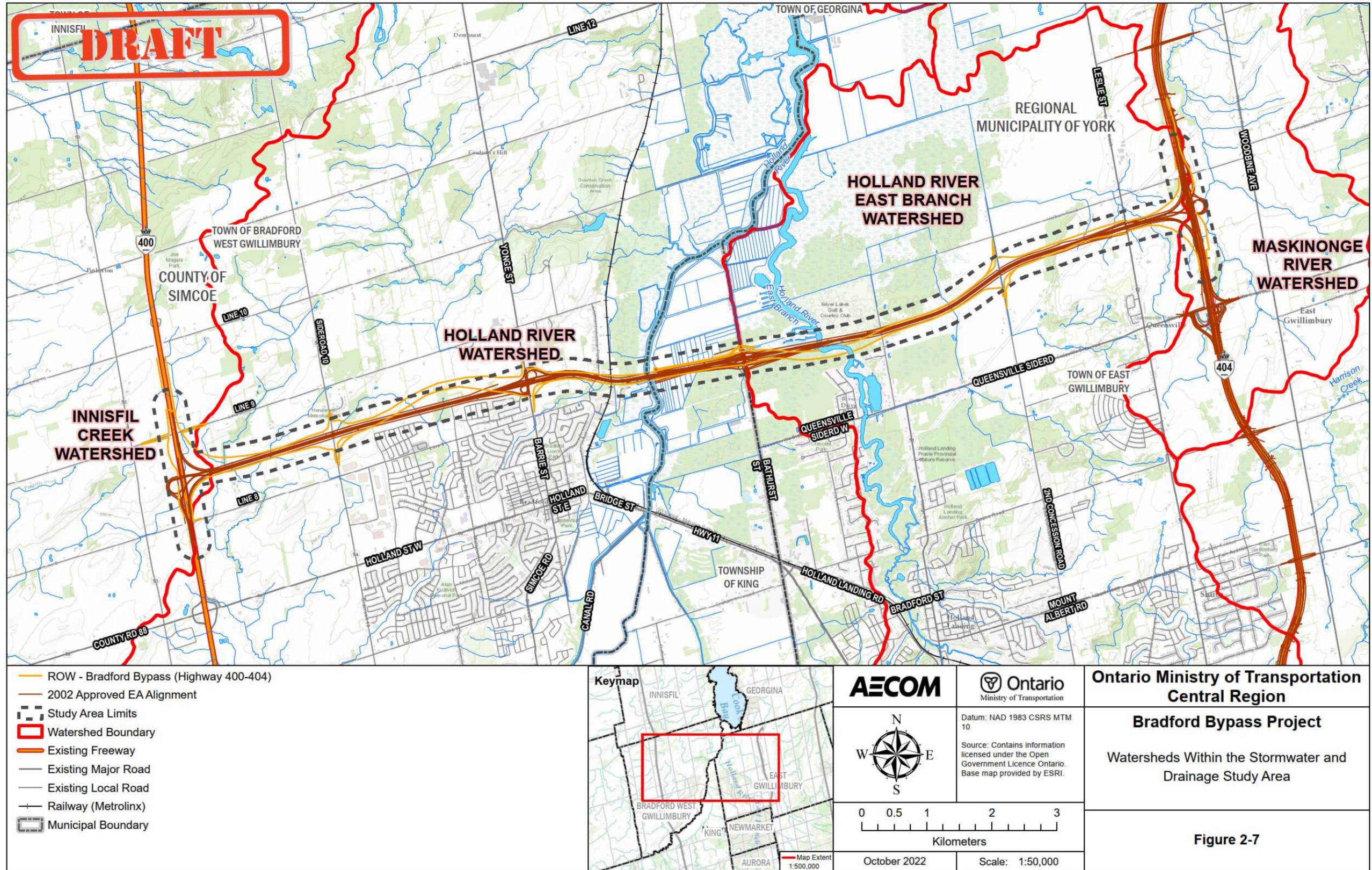
The future Bradford Bypass/ Highway 400 interchange ramps will drain to Penville Creek.

Three river watersheds overlap with the Stormwater and Drainage Study Area, including the Nottawasaga Valley Conservation Authority's Penville Creek/Innisfil Creek, Lake Simcoe Region Conservation Authority's Holland River, and Maskinonge River. The locations of these watersheds in relation to the Stormwater and Drainage Study Area are shown on **Figure 2-7**.

Table 2-11: Summary of Drainage Patterns Within the Stormwater and Drainage Study Area

Location	Drainage Pattern
Highway 400, south of 8th Line	<ul style="list-style-type: none"> ■ Drainage is southerly towards the Holland River tributaries. North of 8th Line, drainage is southwesterly towards Penville Creek, a tributary of Innisfil Creek within the Nottawasaga Valley Conservation Authority jurisdiction.
Corridor between Highway 400 and 10th Sideroad	<ul style="list-style-type: none"> ■ Drainage is southerly towards several tributaries of the Holland River are within the Lake Simcoe Region Conservation Authority’s jurisdiction. The tributaries flow southerly to connect with the Holland River, which flows through the North Canal of the Holland Marsh Specialty Crop Area.
Between 10th Sideroad and Yonge/Barrie Street	<ul style="list-style-type: none"> ■ Drainage is towards the south to the Municipality of Bradford West Gwillimbury where an unnamed tributary flows through an online wetland feature and between several residential developments before connecting to the Holland River.
Between Yonge/Barrie Street and Artesian Industrial Parkway	<ul style="list-style-type: none"> ■ Drainage pattern is southeasterly along the Bradford Bypass corridor towards the valley of the Holland River.
Artesian Industrial Parkway to Bathurst Street	<ul style="list-style-type: none"> ■ The corridor is predominantly within the wide floodplain of the Holland River, which flows northerly towards Cook’s Bay. There are several municipal drains in the area east of the river, which provide drainage for the Holland Marsh agricultural fields. There is significant drainage conveyed along the ditch line of Hochreiter Road to take drainage west to the river.
Between Bathurst and Yonge Street	<ul style="list-style-type: none"> ■ Drainage is towards the north and the lands are mostly associated with the floodplain of the Holland River East Branch. Immediately east of the Holland River, the lands are topographically higher and are not impacted by the riverine flood levels. In general, the central portions of the corridor across the Holland Marsh are very flat and drainage patterns are not easily discernible. Between Yonge Street and 2nd Concession Road drainage is northerly towards a lone unnamed tributary of the Holland River East Branch that feeds into a municipal drain that flows westerly towards the river.
Yonge Street to 2nd Concession Road	<ul style="list-style-type: none"> ■ Drainage is northerly towards a long unnamed tributary of the Holland River East Branch that feeds into a municipal drain that flows westerly towards the river.
2nd Concession Road to Leslie Street	<ul style="list-style-type: none"> ■ Drainage patterns are generally to the north across the corridor and then westerly through a series of municipal drains to eventually discharge to the Holland River East Branch. This area has very little relief based on the available topographic information, which makes establishing existing drainage patterns beyond the main watercourse very challenging.
Highway 404 between Leslie Street and Woodbine Avenue	<ul style="list-style-type: none"> ■ Drainage to the west of Highway 404 is northwesterly towards tributaries of the Holland River East Branch, via a series of municipal drains. To the east of Highway 404, drainage pattern is north-easterly towards the Maskinonge River (LSRCA). The future Highway 400/Bradford Bypass interchange will drain predominantly north to the Maskinonge River.

Figure 2-7: Watersheds Within the Stormwater and Drainage Study Area



2.1.3.3.2 Existing Culvert Characteristics

Thirteen existing centreline culvert crossings were identified within the Stormwater and Drainage Study Area, including at Highway 400, Highway 404 and on sideroads. These culverts were inspected to identify drainage related issues. Although, the visible portion of most of the culverts are in good conditions, it was not practical (due to physical constraints) to observe inside the culverts to determine physical conditions.

The existing drainage features and findings from site inspections for these culverts are documented in **Table 2-12**.

The existing culvert crossings within the Stormwater and Drainage Study Area are shown on **Figure 2-8**.

Table 2-12: Existing Drainage Features of Culverts Within the Stormwater and Drainage Study Area

Culvert ID	Location	Culvert Size	Material	Site Inspection Findings
EX-CL-400-1	Highway 400	1220 x 910	Concrete box	<ul style="list-style-type: none"> ■ Standing water at both the inlet and outlet ■ Dense vegetation at the outlet
EX-CL-400-2	Highway 400	1220 x 910	Concrete box	<ul style="list-style-type: none"> ■ No standing water at the inlet. ■ Standing water at the outlet ■ Dense vegetation at the inlet and outlet ■ Scour at the inlet
EX-CL-400-3	Highway 400	1220 x 910	Concrete box	<ul style="list-style-type: none"> ■ There is standing water at the inlet. ■ There is no standing water at the outlet ■ There is dense vegetation blocking the outlet ■ There is slumping on the embankment at the inlet
EX-CL-400-4	Highway 400	450	High Density Polyethylene	<ul style="list-style-type: none"> ■ The culvert has been filled with grout and abandoned
EX-CL-400-5	Highway 400	3600 x 1500	Concrete box	<ul style="list-style-type: none"> ■ The culvert is in excellent condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is dense vegetation at the inlet and outlet
EX-CL-400-6	Highway 400	1200 x 1200	Concrete box	<ul style="list-style-type: none"> ■ The culvert is in poor condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is dense vegetation at the inlet and outlet ■ The highway embankment is slumped to the culvert
EX-CL-2	Highway 400	1500	Corrugated Steel Pipe	<ul style="list-style-type: none"> ■ The culvert is located downstream of EX-CL-400-6 ■ The culvert is in excellent condition ■ There is no standing water at the inlet or outlet ■ There is overstorey vegetation at the inlet and understorey vegetation at the outlet
EX-CL-8	County Road 4 (Yonge Street)	1200 x 1200	Open bottom concrete box	<ul style="list-style-type: none"> ■ The culvert is in excellent condition ■ There is standing water at the inlet, within the structure and at the outlet ■ At the inlet there is neither overstorey nor understorey vegetation, and at the outlet there is both ■ The downstream channel is does not appear to be well defined
EX-CL-9	County Road 4 (Yonge St)	1200 x 800	Open bottom concrete box	<ul style="list-style-type: none"> ■ The culvert is in excellent condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is overstorey and understorey vegetation at both the inlet and outlet ■ The downstream channel is covered in vegetation
EX-CL-11	Artesian Industrial Parkway	825	Corrugated Steel Pipe	<ul style="list-style-type: none"> ■ The culvert is in good condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is overstorey vegetation at both the inlet and outlet
EX-CL-13	Artesian Industrial Parkway	2400 x 1200	Concrete box	<ul style="list-style-type: none"> ■ The culvert is in excellent condition ■ There is standing water at the inlet, within the structure and at the outlet
EX-CL-19	Leslie Street	800	Corrugated Steel Pipe	<ul style="list-style-type: none"> ■ The culvert is in good condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is overstorey vegetation at both the inlet and outlet
EX-CL-20	Leslie Street	1800	Corrugated Steel Pipe	<ul style="list-style-type: none"> ■ The culvert is in good condition ■ There is standing water at the inlet, within the structure and at the outlet ■ There is overstorey and understorey vegetation at both the inlet and outlet ■ The downstream channel is does not appear to be well defined

Figure 2-8a: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

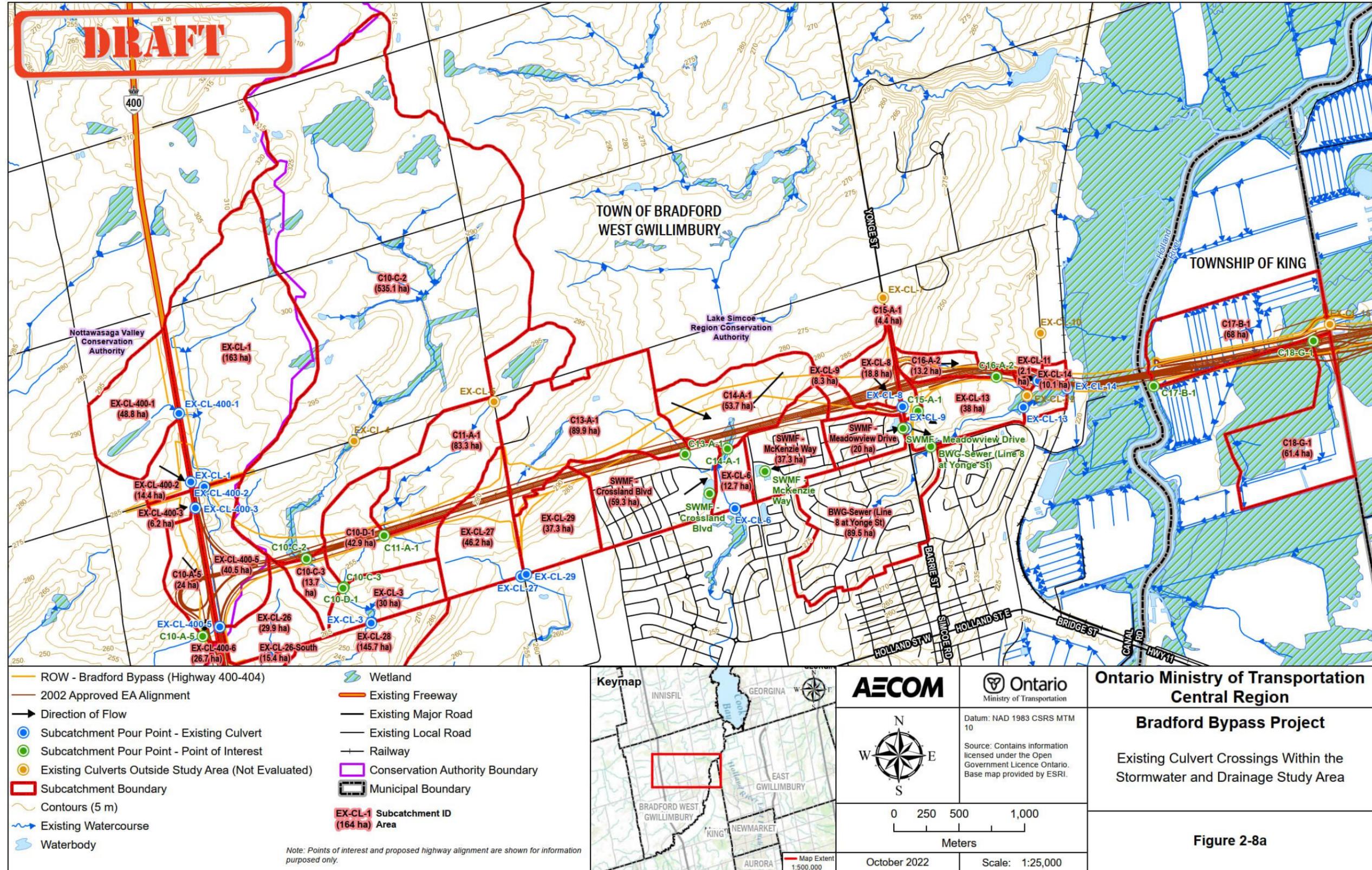


Figure 2-8b: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

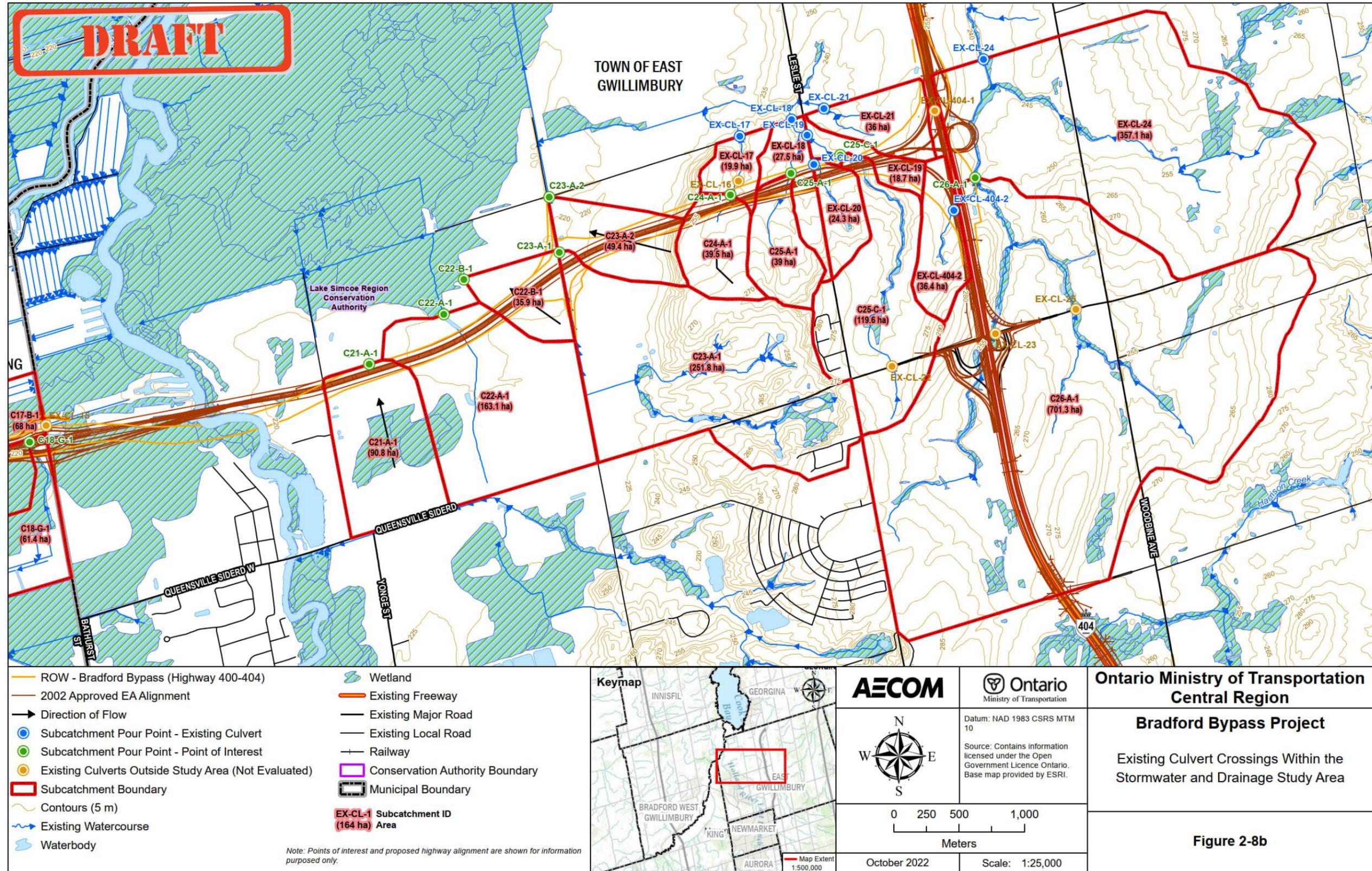


Figure 2-8c: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

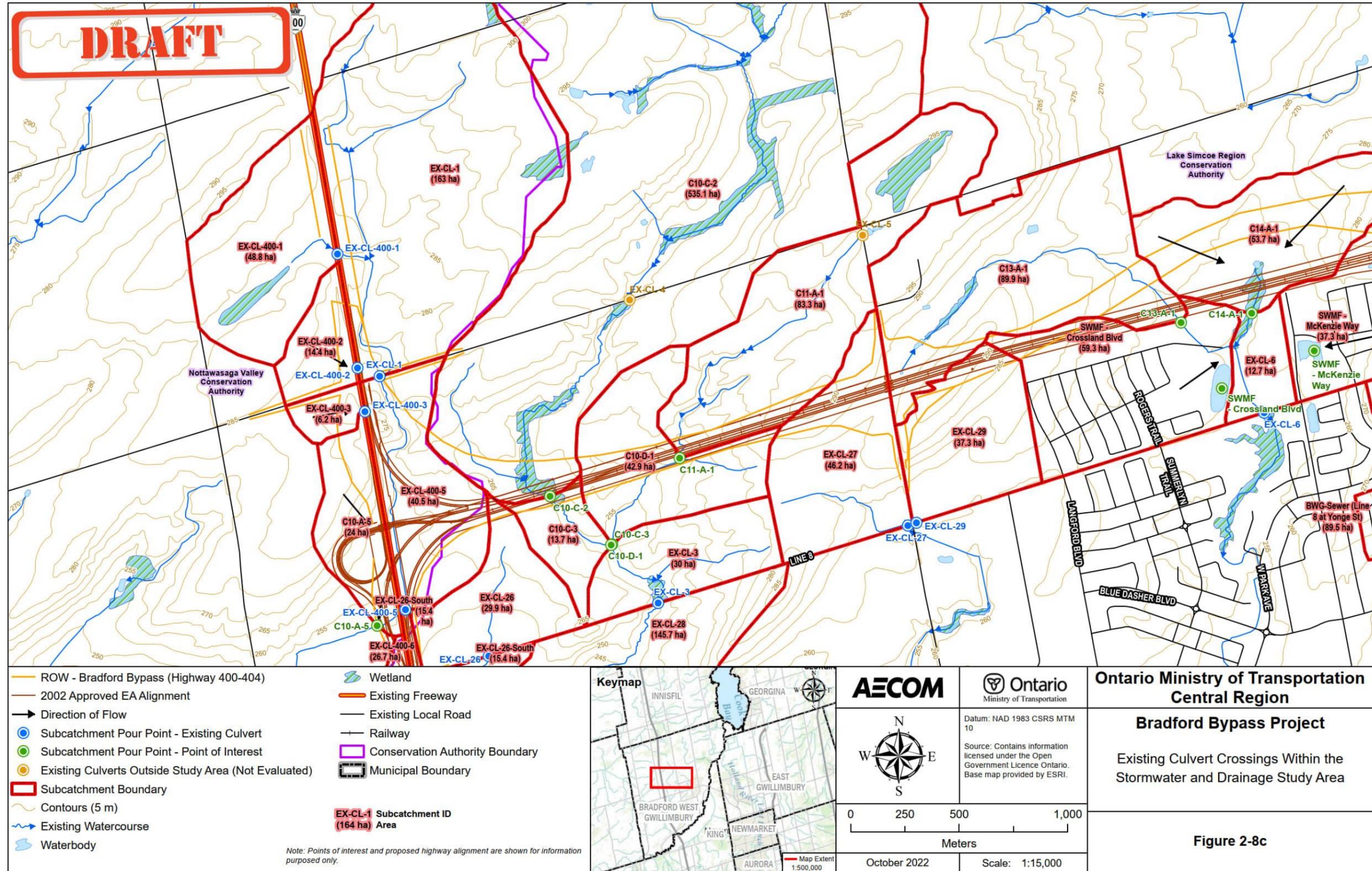


Figure 2-8d: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

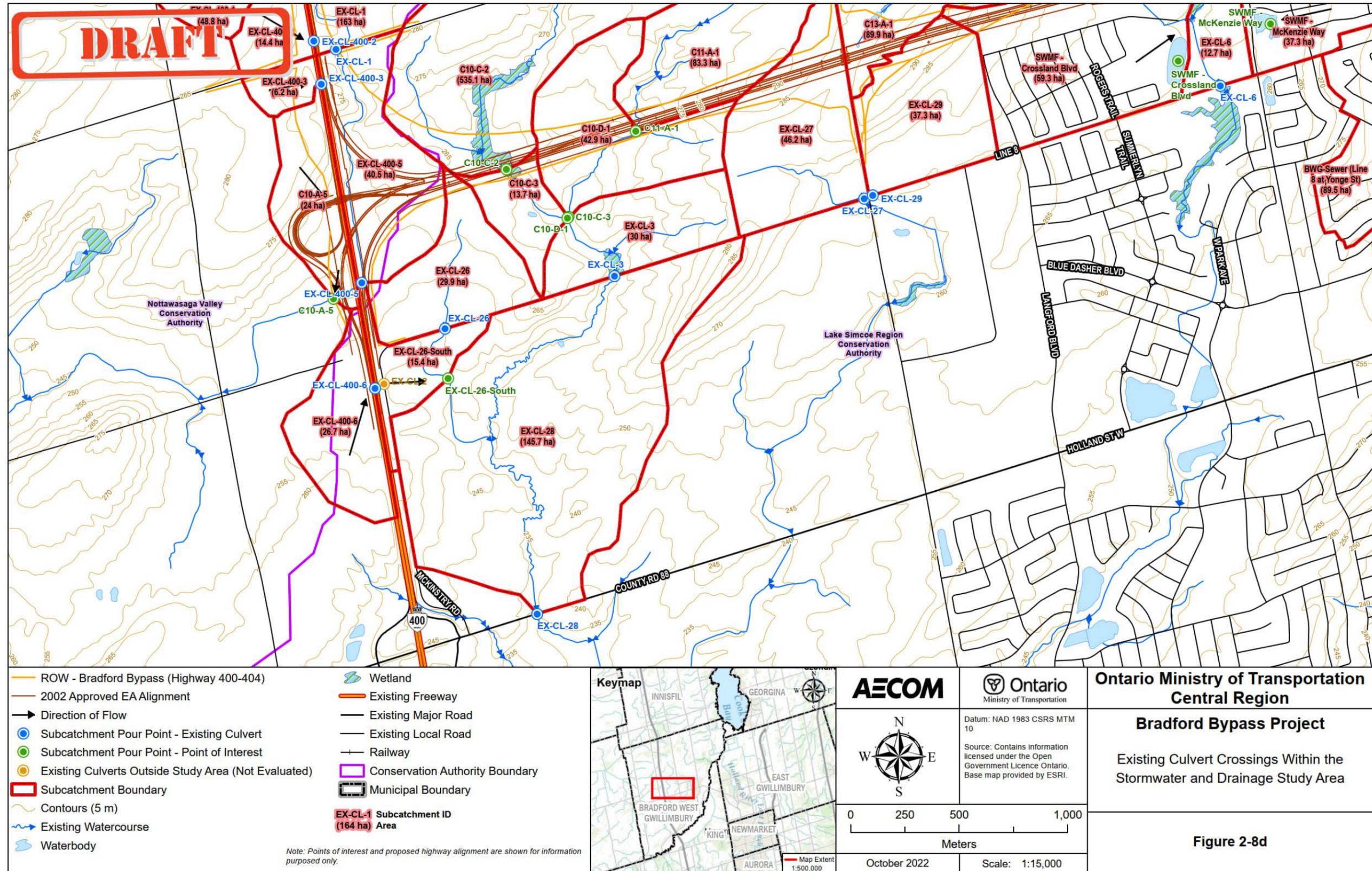


Figure 2-8e: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

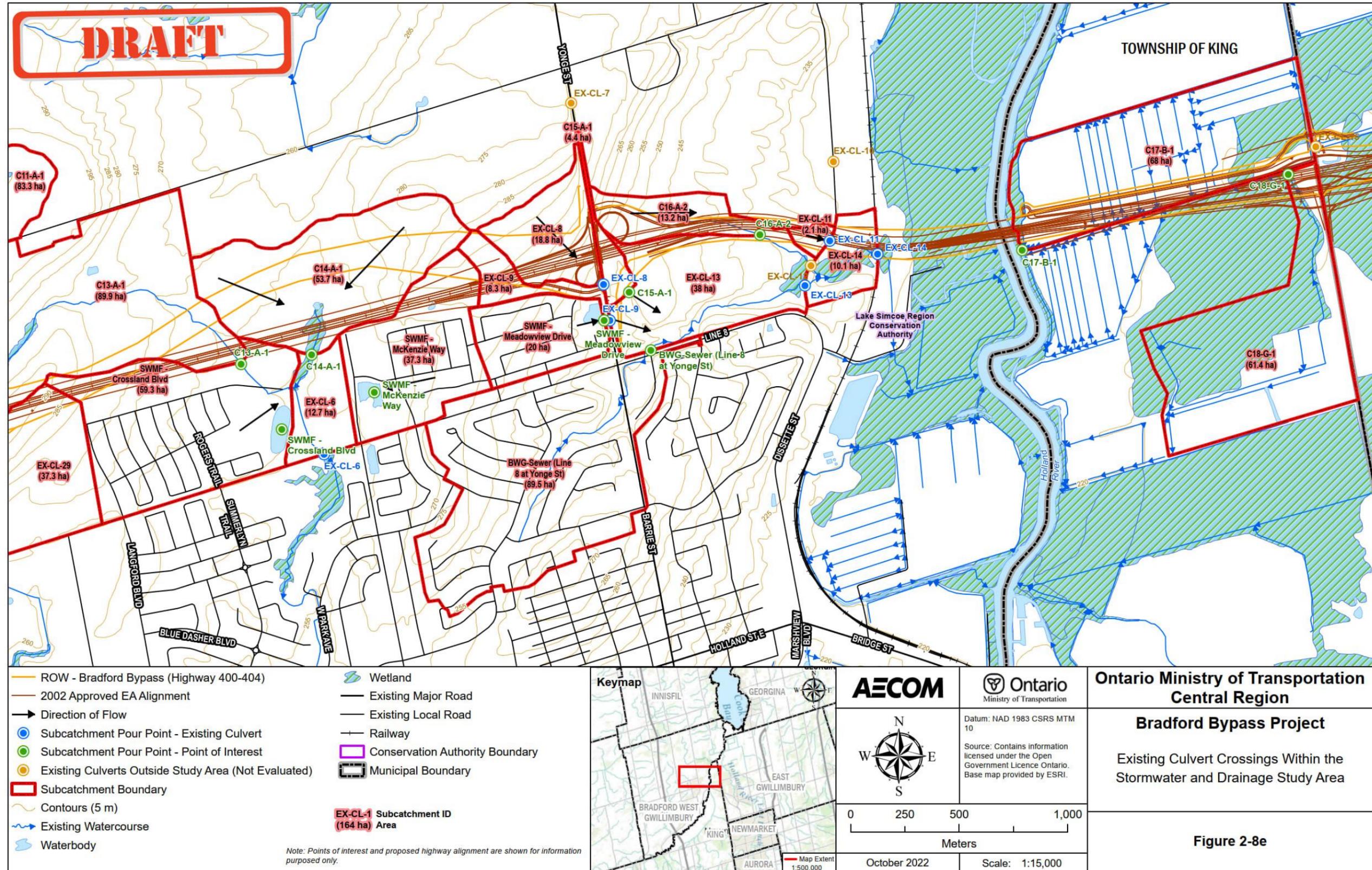


Figure 2-8f: Existing Culvert Crossings Within the Stormwater and Drainage Study Area

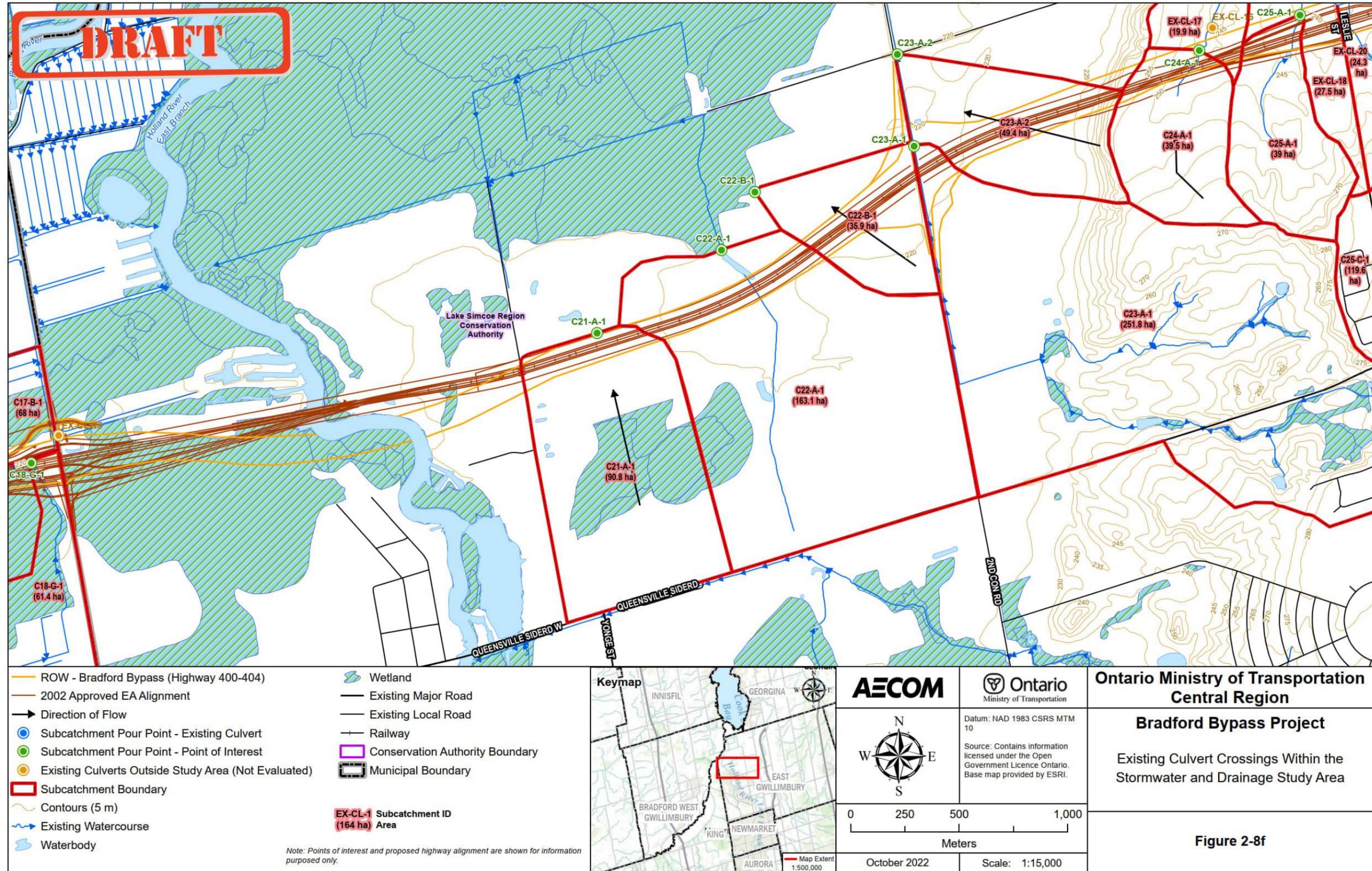
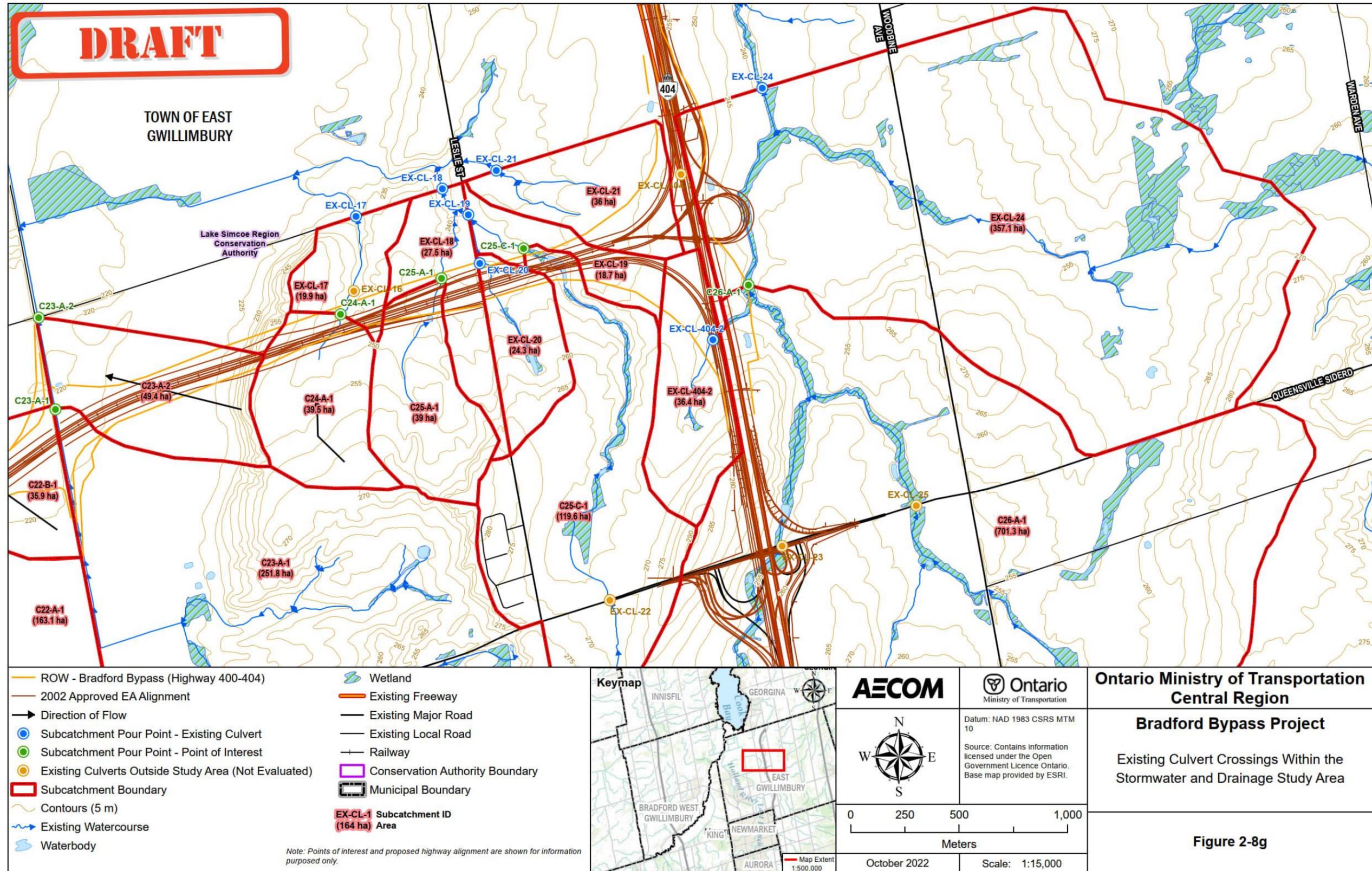


Figure 2-8g: Existing Culvert Crossings Within the Stormwater and Drainage Study Area



2.1.4 Groundwater and Hydrogeology

A groundwater and hydrogeology assessment was completed to characterize the local physical and groundwater setting, quantify potential dewatering requirements for construction, assess possible impacts to local water wells and groundwater dependant environmental features, and recommend appropriate monitoring and/or mitigation measures, as required.

The following sections outline the background, data collection and describe the existing environmental conditions within the Groundwater and Hydrology Study Area.

2.1.4.1 Background

The 2002 Approved Environmental Assessment included a high-level groundwater assessment, description of the existing groundwater conditions within the Study Area, and made recommendations for mitigation should groundwater resources be impacted during further design or construction.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with groundwater and hydrogeology including applicable legislation and environmental conditions. As such, an update to the description of the environmental conditions within the Groundwater and Hydrogeology Study Area is included in the following sections below.

2.1.4.2 Data Collection

A Door to Door Water Well Survey was completed as part of the project and involved a review of available project documentation and design information relating to the proposed construction activities and methods, as well as a desktop review of existing published information, including:

- Aerial photographs
- Available Ontario Ministry of the Environment, Conservation and Parks Water Well Record and Permit to Take Water databases (including Environmental Bill of Rights registry)
- Available mapping (e.g., topographic, base mapping, geological) and reports (e.g., watershed plans, aquifer vulnerability mapping, site-specific investigations)
- Subsurface or other hydrogeological information that AECOM and/or the Ministry of the Environment, Conservation and Parks may have on file which pertains to the Groundwater and Hydrogeology Study Area
- Geotechnical data/reports carried out as part of the current project, if available.

The purpose of the initial desktop review and field reconnaissance was to identify, on a preliminary basis to the extent possible, the following:

- General groundwater usage including aquifers, well types and locations
- Location and use of large volume wells, if present
- Wells with known quality and/or quantity problems.

Upon completion of the preliminary desktop review, AECOM staff mailed a letter to all known and listed properties in the Ministry of the Environment, Conservation and Parks database. The letter along with a form explained the water well survey work. The homeowners were given one month upon receipt of the letter and form to complete and return. The water well survey form allowed the homeowners to confirm groundwater use and to provide basic well information, including the location, type, depth, condition, use, yield, and water quality of any identified wells. A stamped envelope was left at each residence in a conspicuous location (i.e., in mailbox or front door) for completion by the property owner and return mailing to AECOM.

For each identified well source where access permission was obtained from the property owner, a baseline well survey / assessment was carried out to document pre-construction conditions (quality and quantity). The scope of each baseline (pre-construction) well survey was developed based on requirements outlined in the following reference documents:

- a) Ministry of Transportation, April 2004. Guidelines for Drinking Water Sampling and Testing in Ministry of Transportation Activities
- b) Ministry of the Environment, Conservation and Parks, December 2009. Water Supply Wells – Requirements & Best Management Practices. Chapter 10 – Yield Test.

The baseline survey for each identified well (where accessible) included the following elements, at a minimum:

1. Interview with the current property owner and/or tenant
2. Documentation of well construction details (including well type, diameter, casing material, total depth, stick-up, general condition, co-ordinate location, etc.) in written form and through the collection of digital photographs
3. Collection of a representative raw (untreated) water sample for analysis of general water quality (pH; total hardness; total alkalinity; calcium, magnesium, sodium; potassium; iron, manganese; chloride; sulphate;

nitrate [NO₃-N]; nitrite [NO₂-N], ammonia / ammonium [NH₃-N]; electrical conductivity; total dissolved solids [TDS]; total suspended solids [TSS]; tannin and lignins) and microbiological (E. coli, faecal coliforms, total coliforms) parameters.

Variations to the generalized methodology below were made in the field, as required, based on site-specific conditions encountered at each property and/or requests made by individual property owners:

Private wells were not opened, and measurement of groundwater levels and completion of well yield tests were not completed as part of this program. Groundwater samples were obtained from untreated taps to obtain a representative sample. Groundwater quality samples were submitted under chain of custody documentation to a Canadian Association for Laboratory Accreditation-accredited environmental analytical laboratory for general inorganic and microbiological testing. Any exceedances of the applicable drinking water standards were reported to the well owner, the Ministry, and to the local public health unit, where appropriate.

As detailed in the Ministry of Transportation Guidance Document (April 2004), the following standard forms were referenced by AECOM in the completion of this assignment:

- Form 1: Field Survey Documentation Form
- Form 2: Standard Checklist for Collection and Handling of Drinking Water Samples
- Form 3: Letter to Licensed Laboratory
- Form 4: Analytical Results Comparison Table
- Form 5: Notification Letter – No exceedance of Regulated Parameters
- Form 6: Notification Letter – Exceedance of Ministry of Transportation Mandatory Parameters
- Form 7: Notification Letter – Exceedance of Other Regulated Parameters
- Form 8: Communication Record
- Form 9: Checklist for Well Water Quantity Testing

Results of the Door-to-Door Water Well Survey are ongoing and will be summarized in the Environmental Impact Assessment Report, under separate cover.

2.1.4.3 Description of Environmental Conditions

According to the Physiography of Southern Ontario (Chapman and Putnam, 1984) the Groundwater and Hydrogeology Study Area is located within three physiographic regions. The majority of the Groundwater and Hydrogeology Study Area is located within the Simcoe Lowlands and Schomberg Clay Plains, with a small section of the western part of the Groundwater and Hydrogeology Study Area (near Highway 400) being situated in the Peterborough Drumlin Field. The Groundwater and Hydrogeology Study Area within Simcoe Lowlands and Schomberg Clay Plains mainly consists of clay plains and drumlinized till plains with interspersed drumlins, while sand plains are observed in a limited area east of the Holland River.

Organic deposits of peat and muck are present along the valley of the Holland River. The Peterborough Drumlin Field within the Groundwater and Hydrogeology Study Area (i.e., a limited section at the west end of the Groundwater and Hydrogeology Study Area in the vicinity of Highway 400) consists of drumlinized till plains with interspersed drumlins. The results of the field investigations indicate that the predominant subgrade soils consist of silty clay, clayey silt, silt with clay, clayey silt with sand, sand, silty sand, or silt. The Quaternary Geology within the Groundwater and Hydrogeology Study Area is shown on **Figure 2-9**.

Figure 2-9a: Quaternary Geology Within the Groundwater and Hydrogeology Study Area

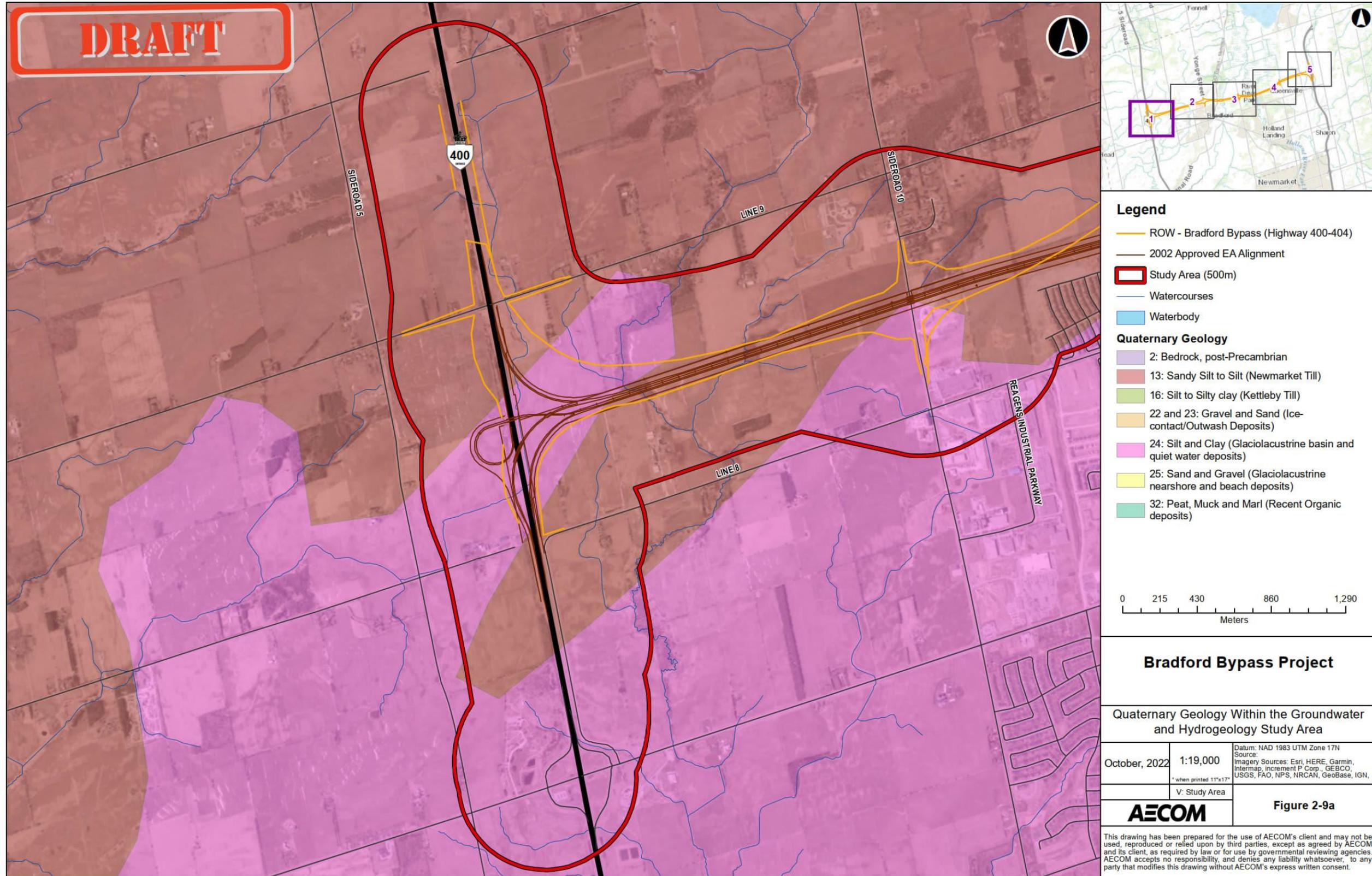


Figure 2-9b: Quaternary Geology Within the Groundwater and Hydrogeology Study Area

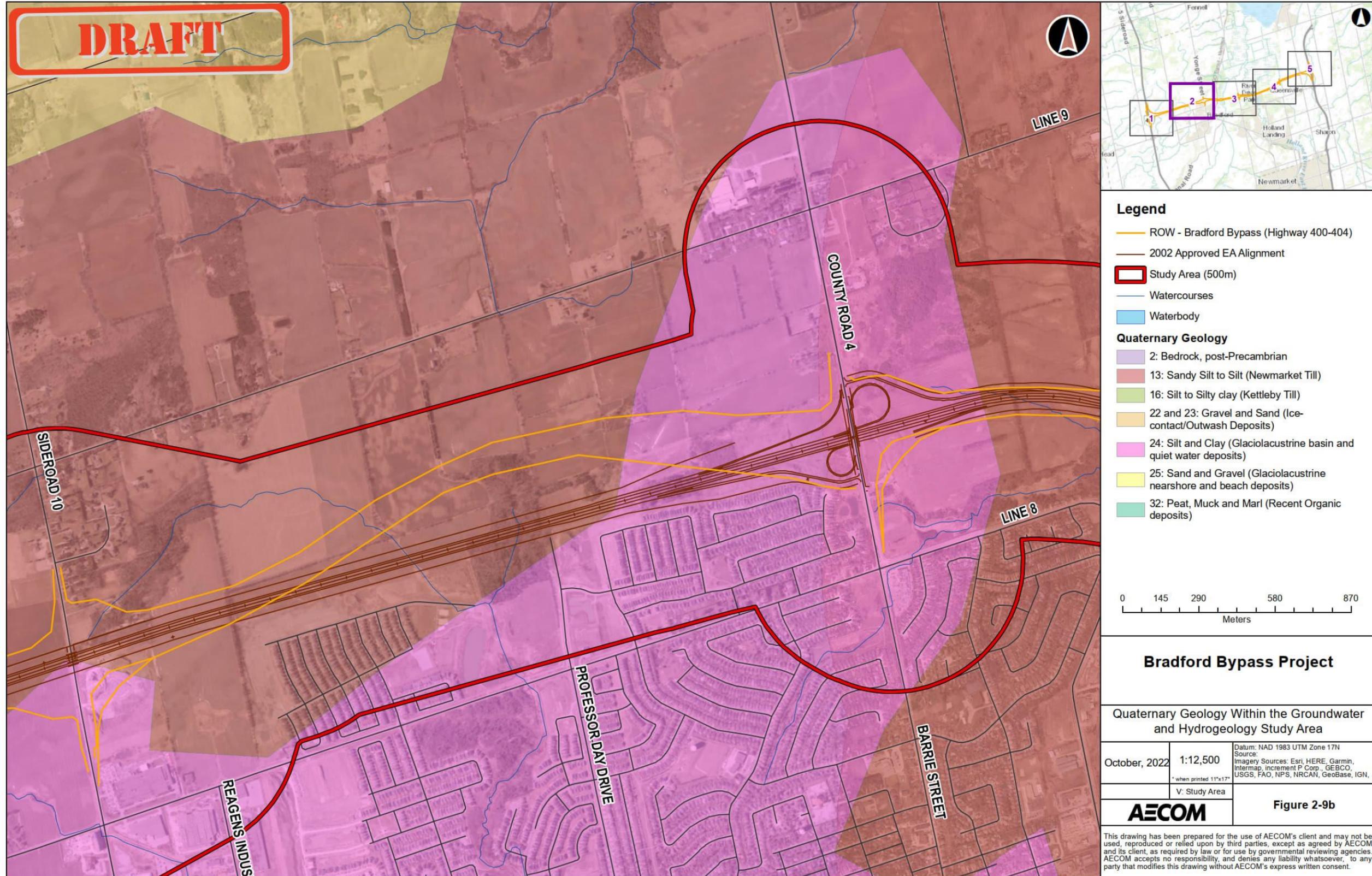


Figure 2-9c: Quaternary Geology Within the Groundwater and Hydrogeology Study Area

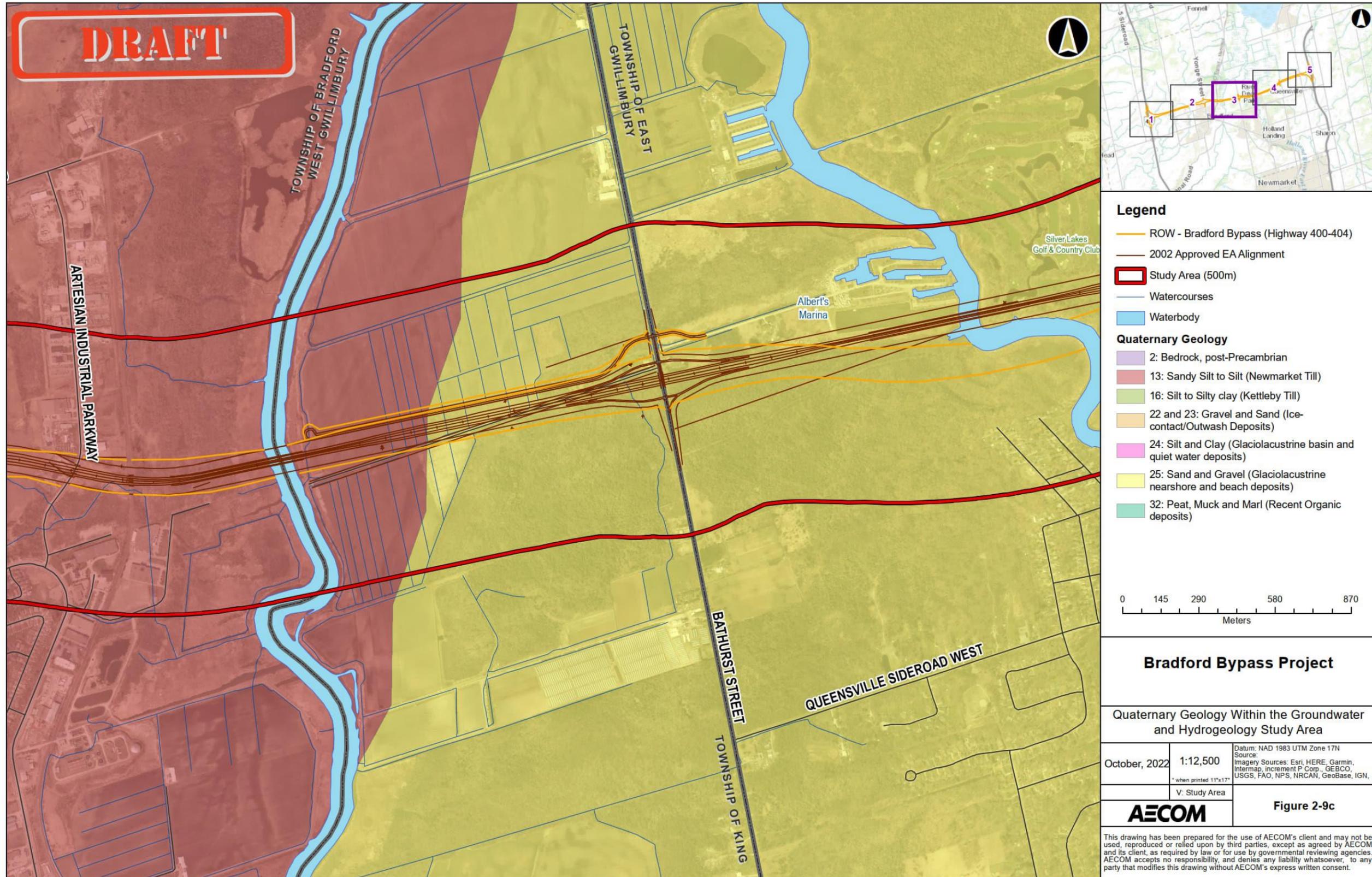


Figure 2-9d: Quaternary Geology Within the Groundwater and Hydrogeology Study Area

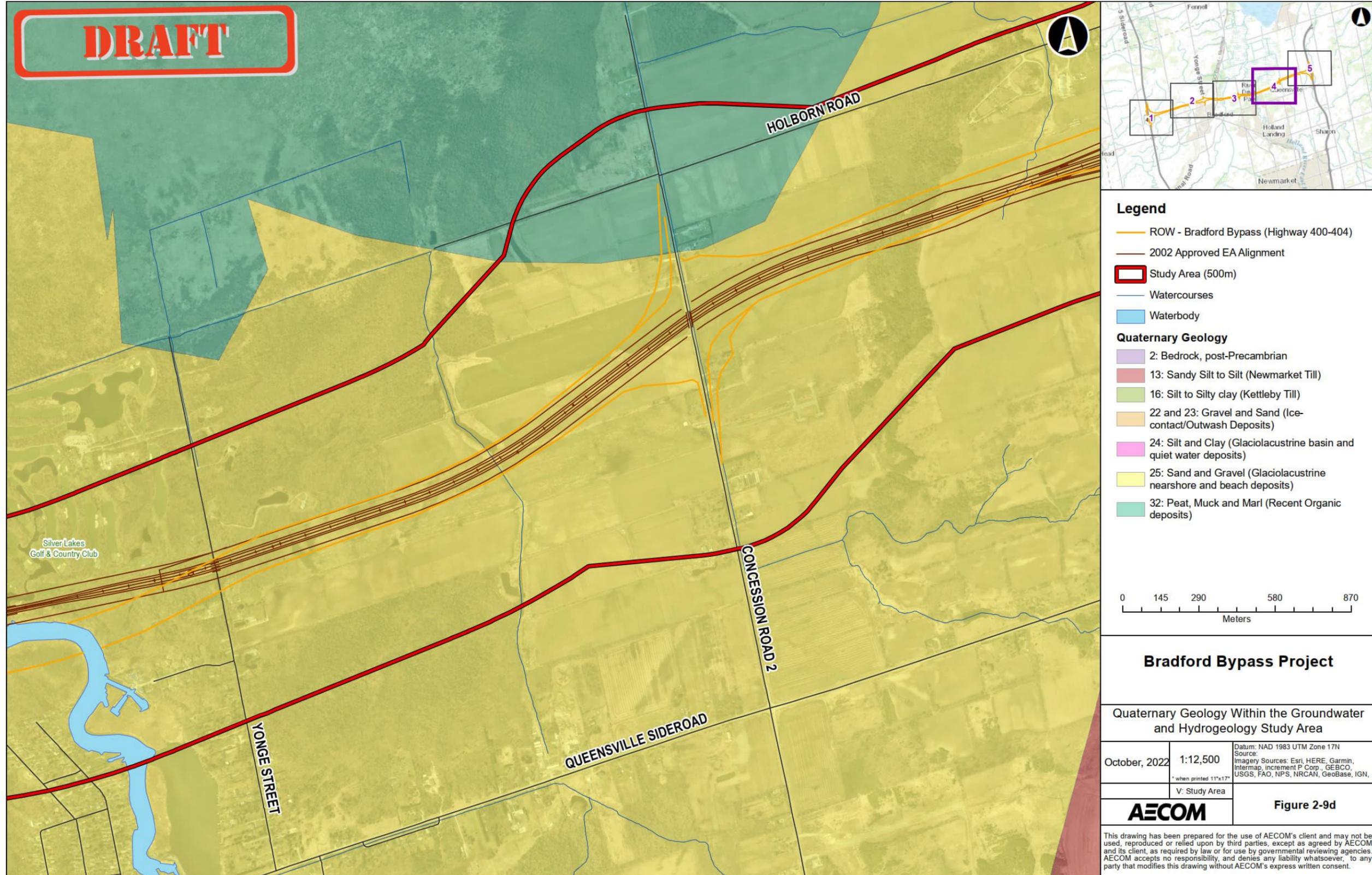
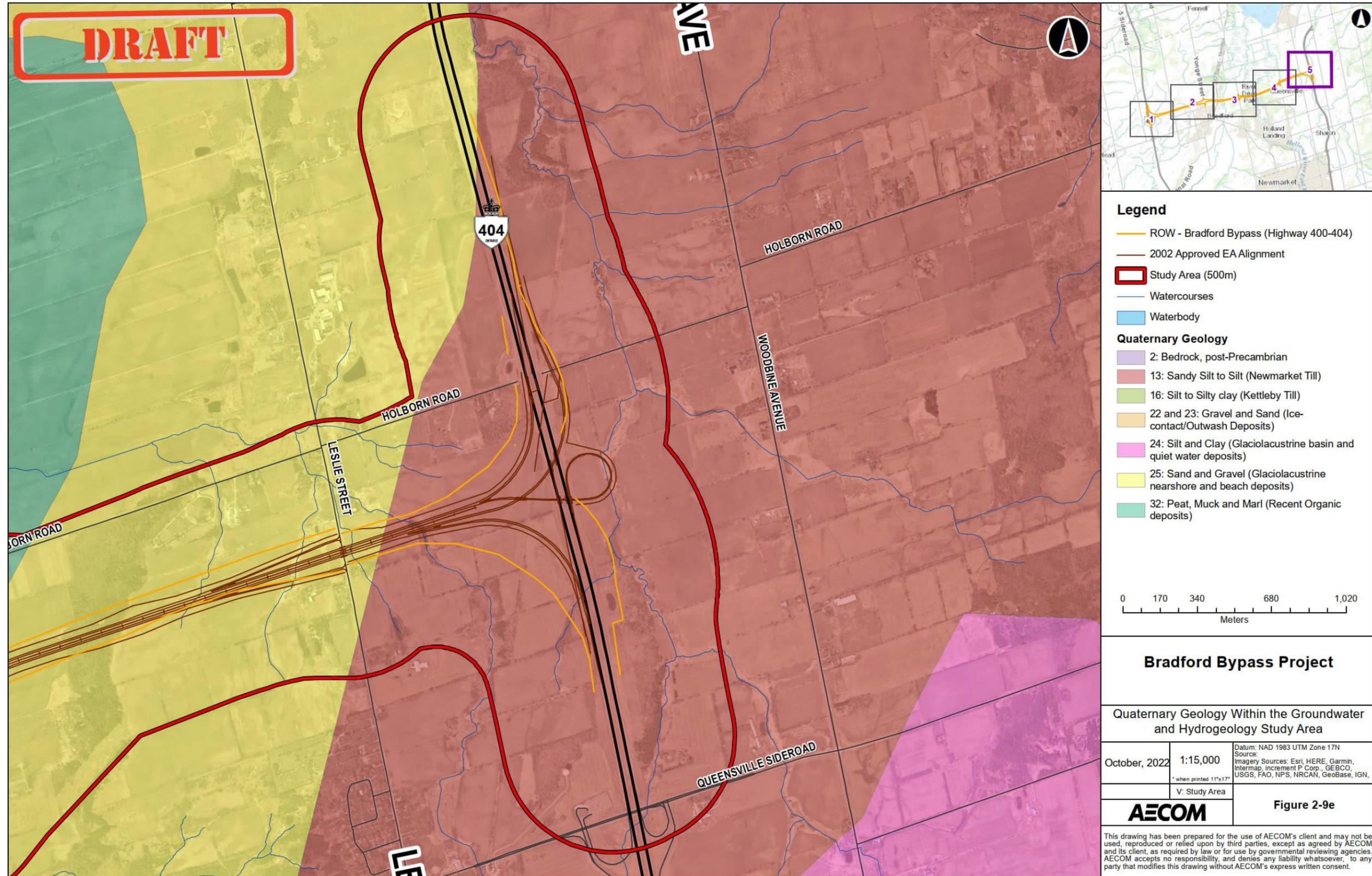


Figure 2-9e: Quaternary Geology Within the Groundwater and Hydrogeology Study Area



Bedrock within the Groundwater and Hydrogeology Study Area consists mainly of limestone, dolostone, shale, arkose, and sandstone, and is shown on **Figure 2-10**.

Based on the Make a Topographic Map Application, available online through the Ministry of Natural Resources and Forestry, the ground surface within the Groundwater and Hydrogeology Study Area is generally undulating with a downward gradient from the surrounding areas (east and west) to the Holland River and ultimately towards Lake Simcoe. The ground surface elevations range throughout the Groundwater and Hydrogeology Study Area, moving eastward from approximately 275 metres above sea level at Highway 400, to 285 metres above sea level at 10th Sideroad, to 210 metres above sea level at the Holland River, to 220 metres above sea level at 2nd Concession Road to 250 metres above sea level at Highway 404.

2.1.4.3.1 Local Subsurface Conditions

Soil stratigraphy within the Groundwater and Hydrogeology Study Area has been interpreted based on the results of a project-specific subsurface (geotechnical) investigation program completed by Golder Associates Ltd. (Golder) that included the advancement of 21 monitoring wells within the Groundwater and Hydrogeology Study Area. Groundwater level monitoring, testing and water quality sampling is ongoing and will be summarized in a Hydrogeological Investigation Report, prepared under a separate cover. Monitoring well locations are shown on **Figure 2-11**.

Figure 2-10: Bedrock Within the Groundwater and Hydrogeology Study Area

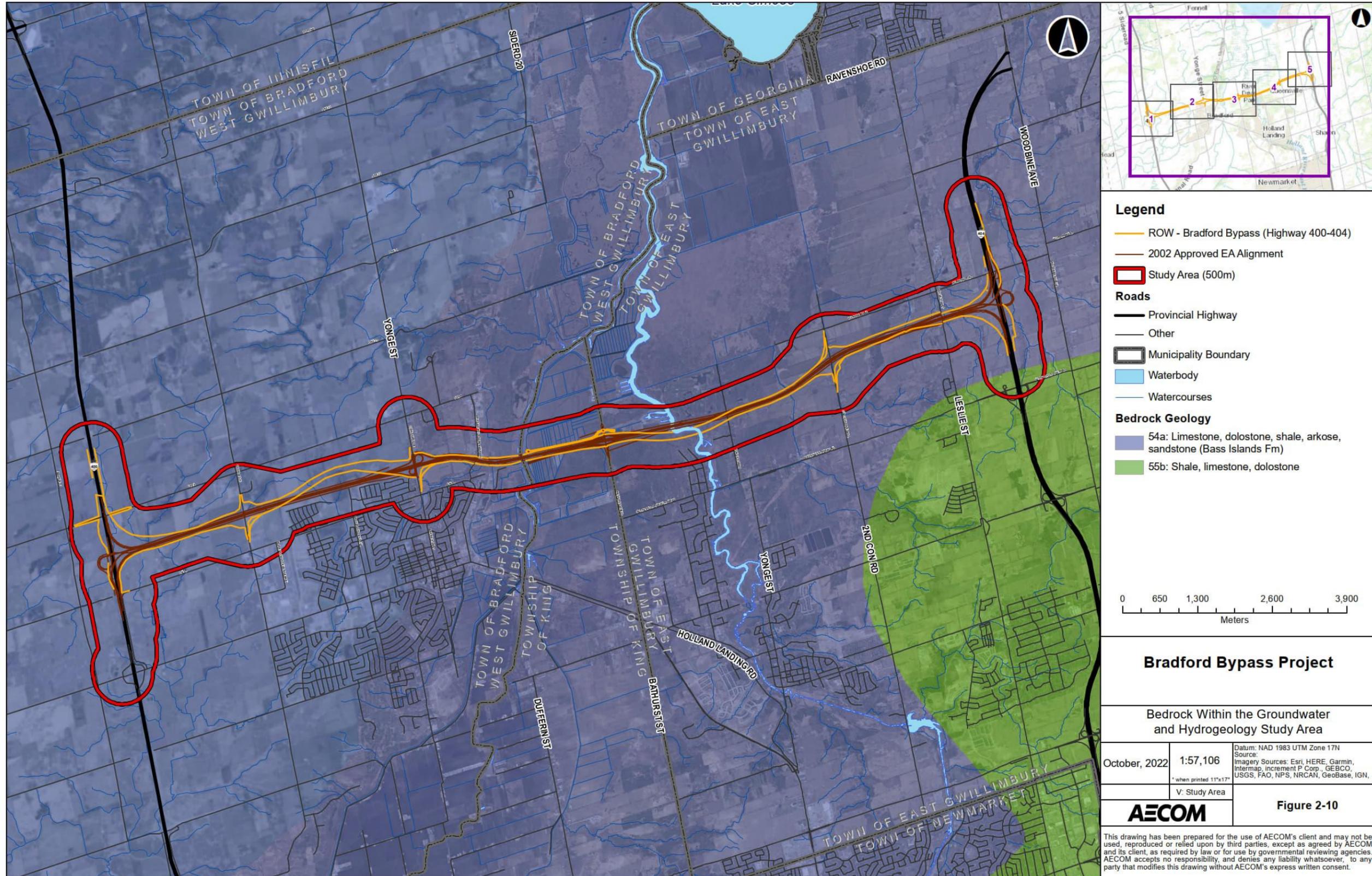


Figure 2-11a: Monitoring Well Locations Within the Groundwater and Hydrogeology Study Area

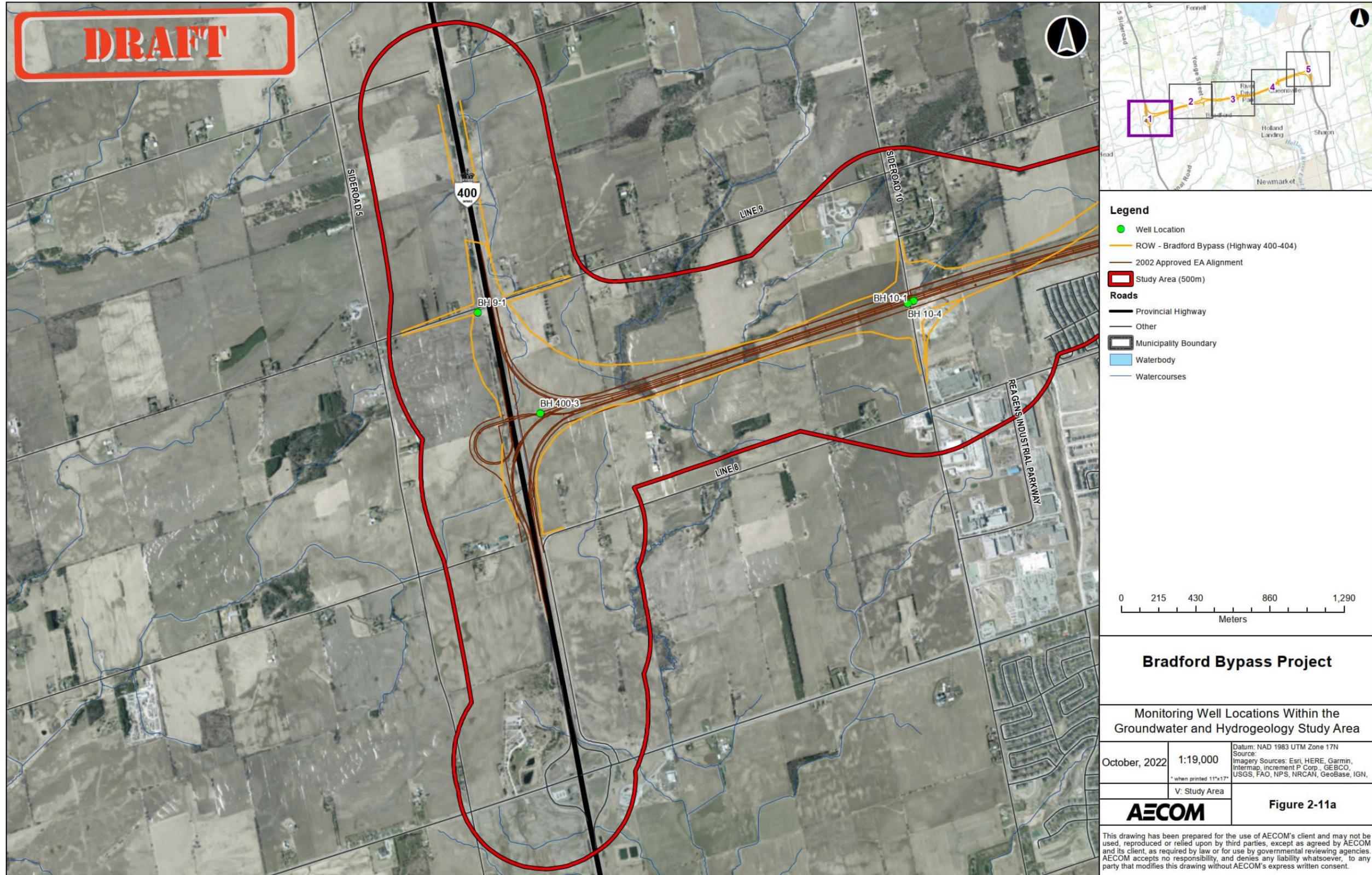


Figure 2-11b: Monitoring Well Locations Within the Groundwater and Hydrology Study Area

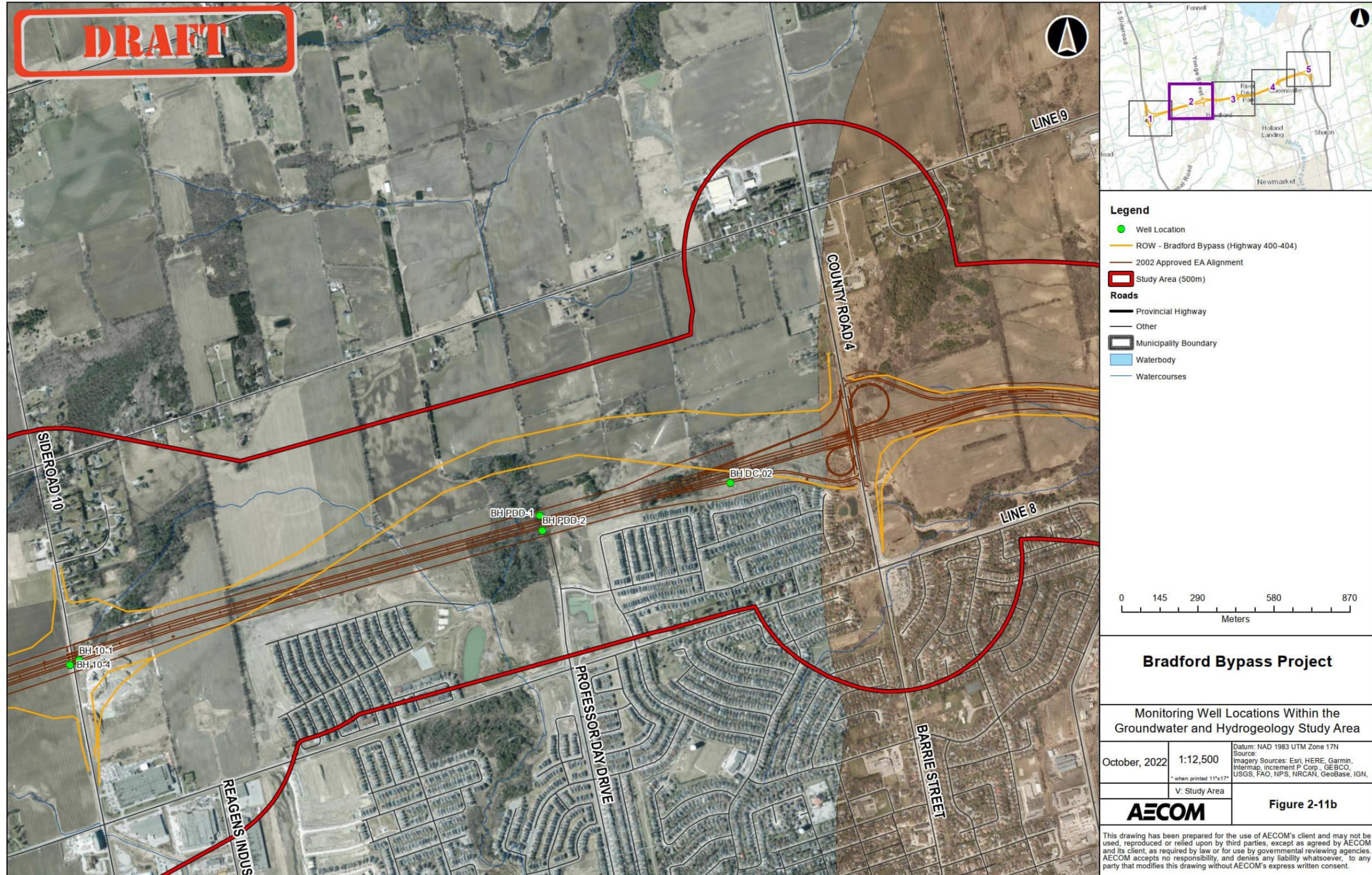


Figure 2-11c: Monitoring Well Locations Within the Groundwater and Hydrogeology Study Area

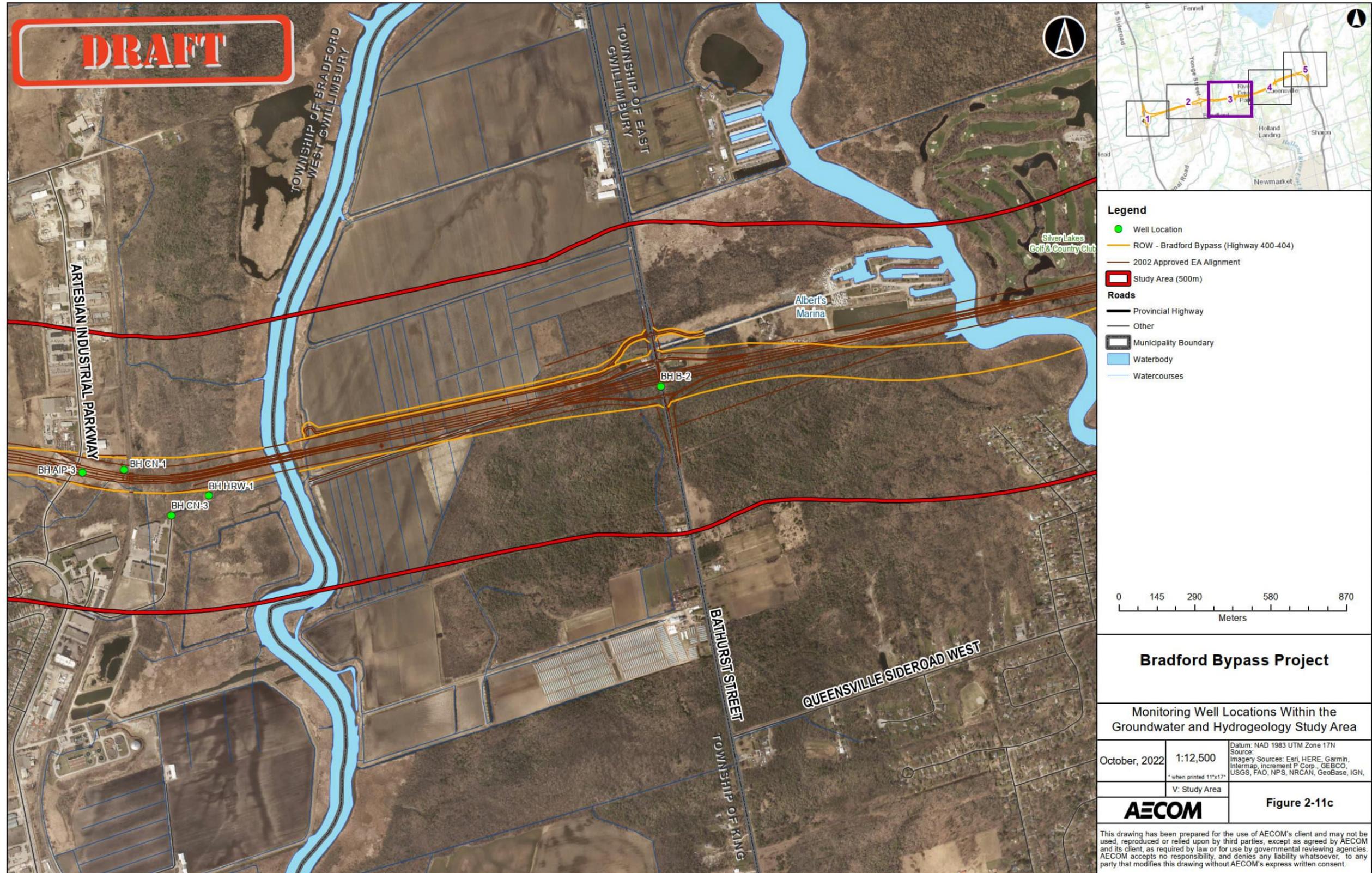


Figure 2-11d: Monitoring Well Locations Within the Groundwater and Hydrogeology Study Area

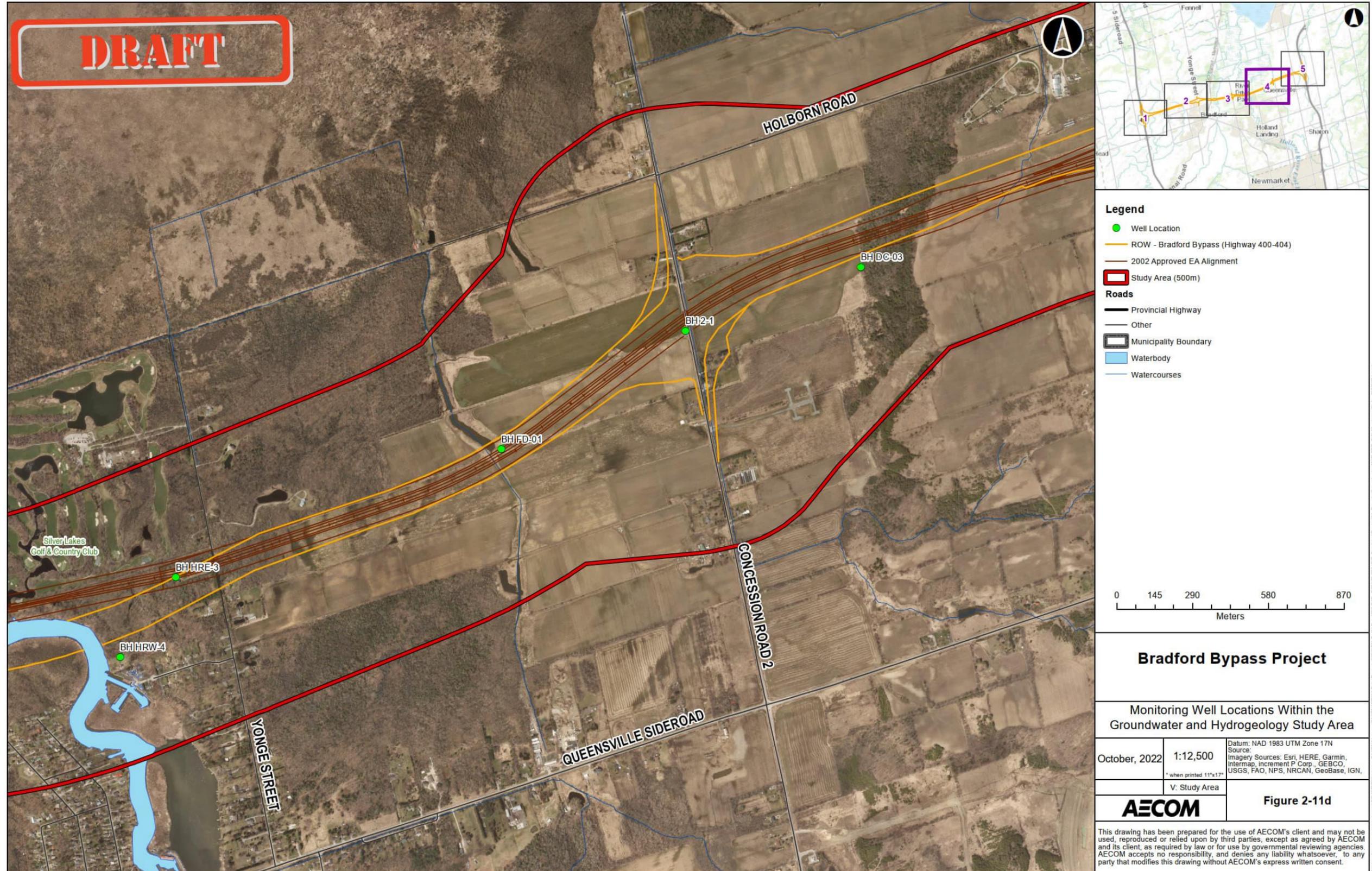
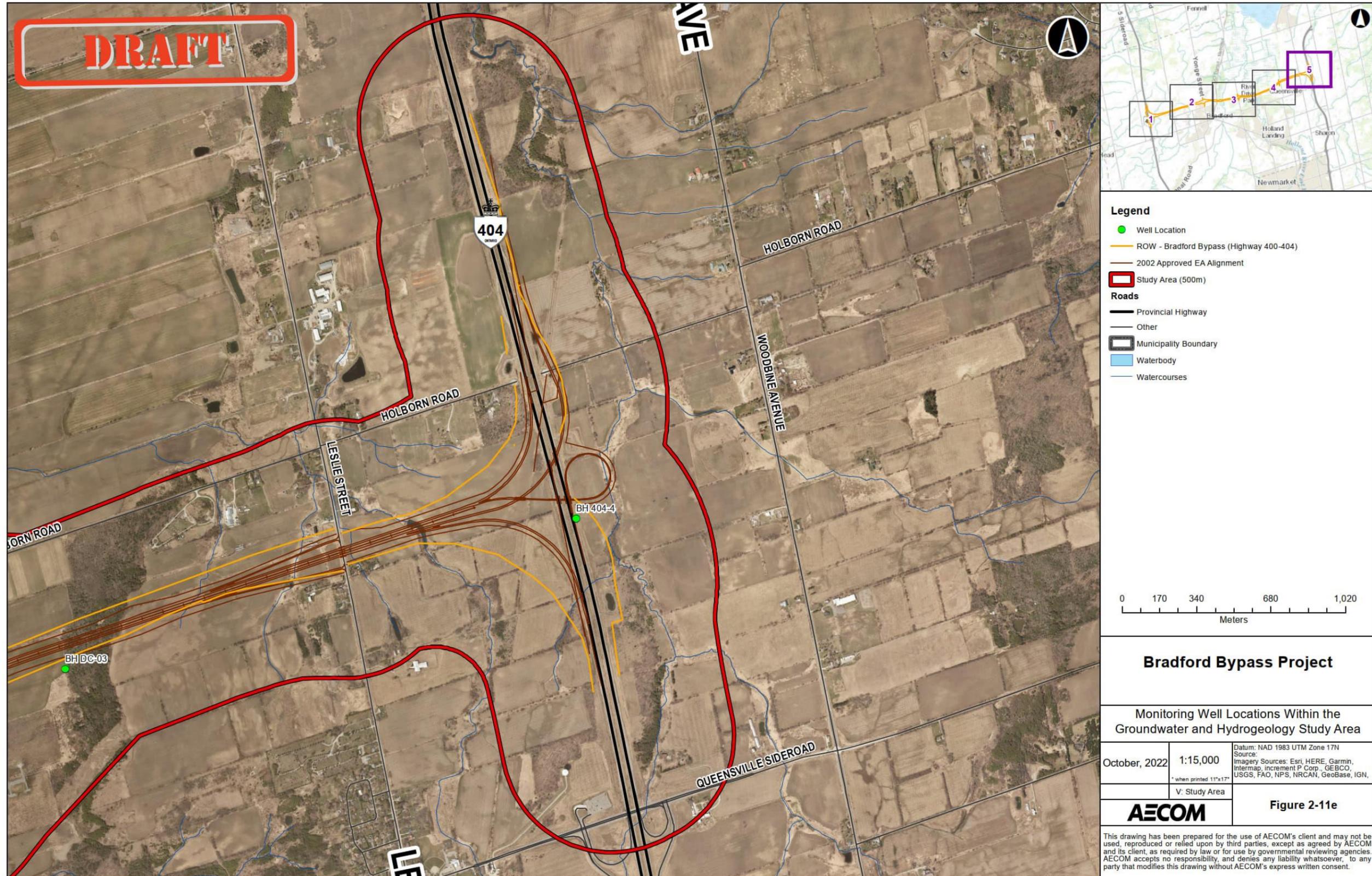


Figure 2-11e: Monitoring Well Locations Within the Groundwater and Hydrogeology Study Area



2.1.4.3.2 Existing Groundwater Users

Potable water in the rural areas is dependent on private well water, while potable water in urban areas is municipally serviced with water obtained from a combination of well water and surface water sources. Overall, 413 records from the Ministry of the Environment, Conservation and Parks Water Well Records were identified within the Groundwater and Hydrogeology Study Area by primary well use and are summarized in **Table 2-13**. Built features within the Groundwater and Hydrogeology Study Area are shown on **Figure 2-12**.

Table 2-13: Summary of Ministry of the Environment, Conservation and Parks Water Well Record Information

Primary Water Use	Number of Well Records	Well Depth (metres)	Well Type
Water Supply – Commercial	8	■ 42.1 to 110.6	■ 6 overburden ■ 1 bedrock ■ 1 unknown
Water Supply – Domestic	226	■ 4.6 to 129.5 (data unavailable for 1 well)	■ 196 overburden ■ 22 bedrock ■ 8 unknown
Water Supply – Industrial	4	■ 16.8 to 133.2	■ 2 overburden ■ 2 bedrock
Water Supply – Livestock	19	■ 4.6 to 84.4	■ 17 overburden ■ 1 bedrock ■ 1 unknown
Water Supply – Municipal	1	■ 93.3	■ 1 overburden
Water Supply – Public	1	■ 107.3	■ 1 overburden
Water Supply – Not Used	1	-	■ 1 overburden
Monitoring/ Observation/ Test Hole	44	■ 1.9 to 112.8 (data unavailable for 1 well)	■ 2 bedrock ■ 6 overburden ■ 36 unknown
Unknown/ Unfinished	32	■ 4.9 to 140.2 (data unavailable for 25 wells)	■ 2 overburden ■ 30 unknown
Abandoned	77	■ 1.8 to 137.8 (data unavailable for 60 wells)	■ 5 overburden ■ 72 unknown

Figure 2-12a: Built Features Within the Groundwater and Hydrogeology Study Area

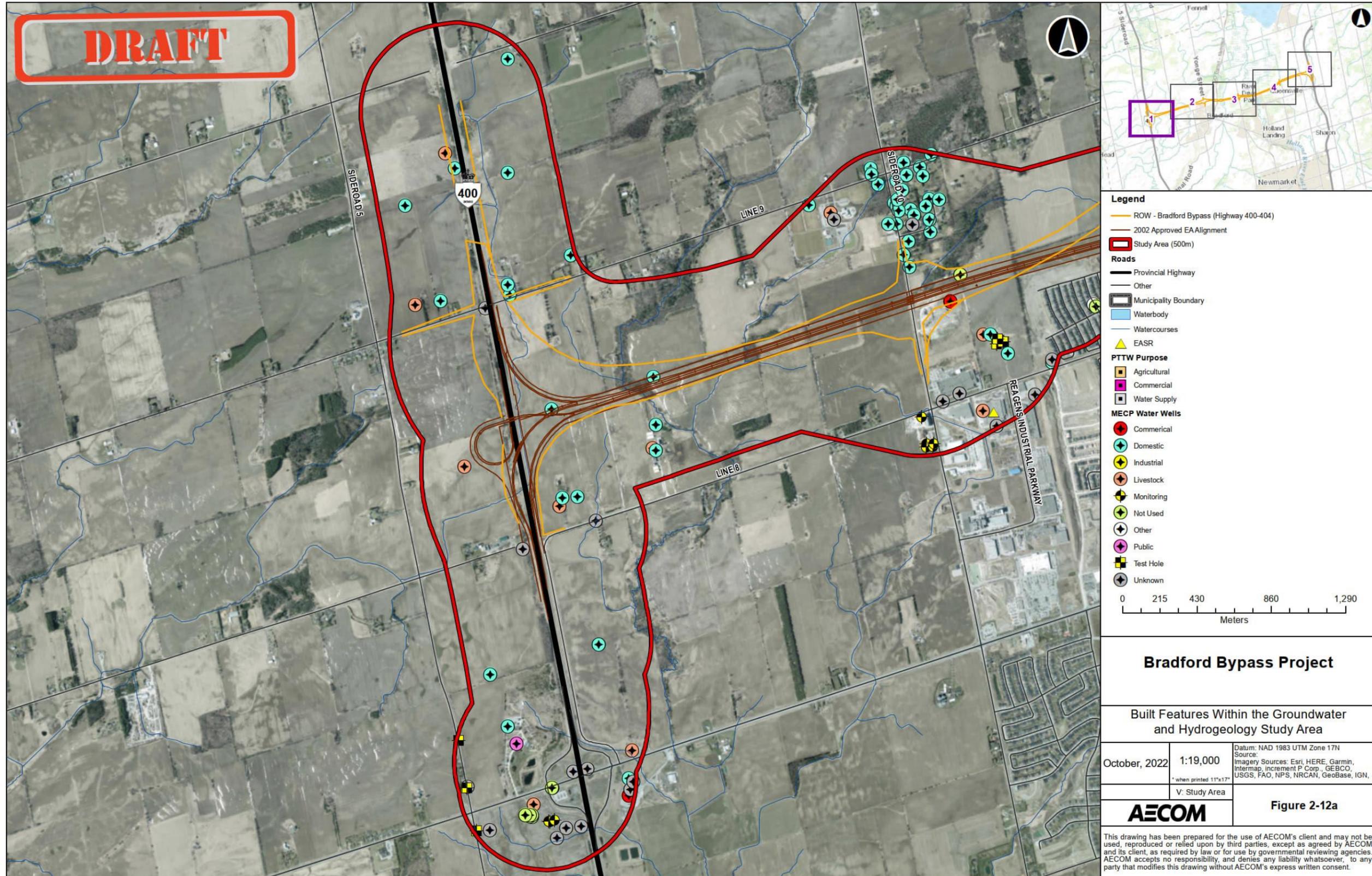


Figure 2-12b: Built Features Within the Groundwater and Hydrogeology Study Area

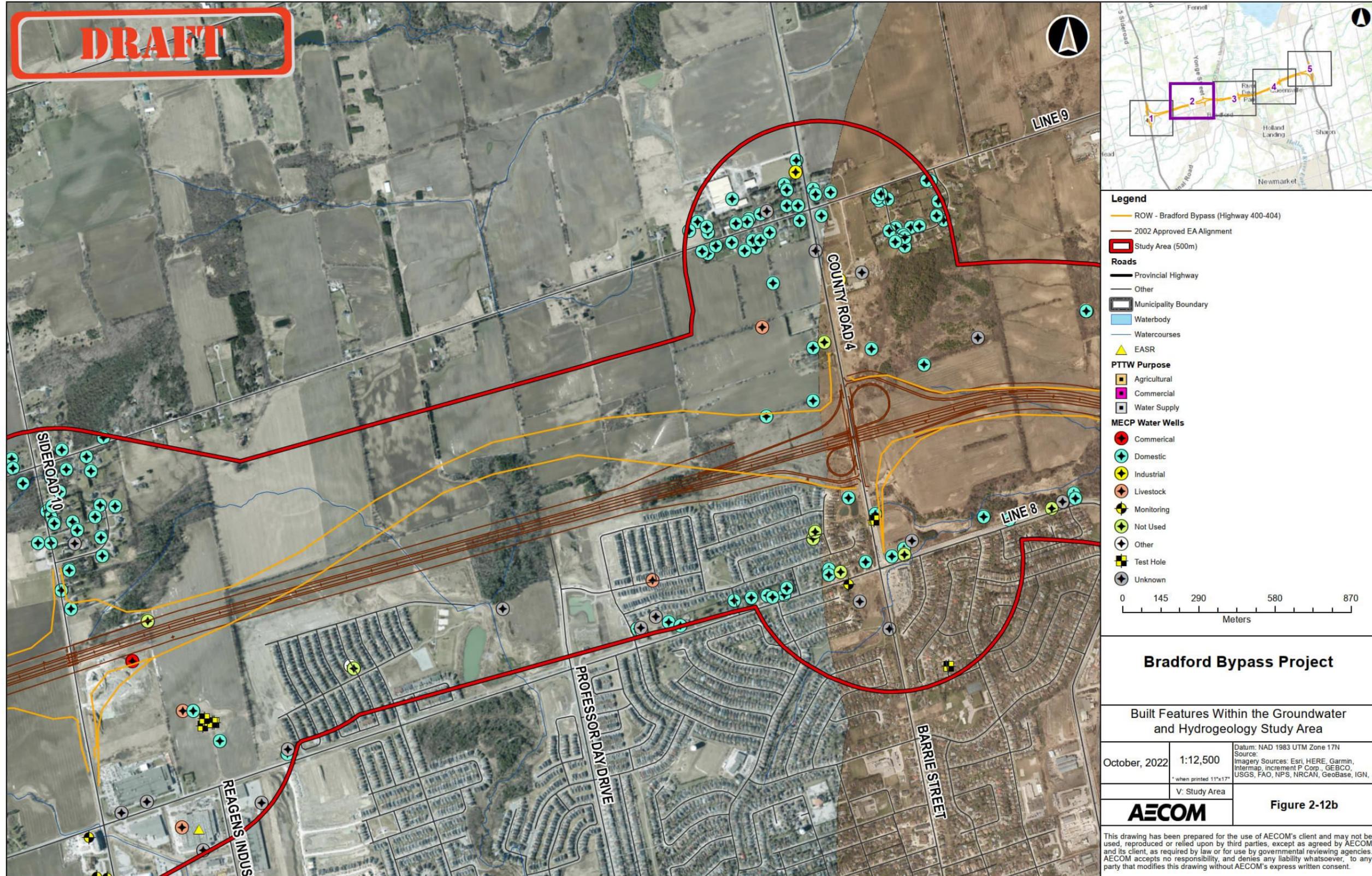


Figure 2-12c: Built Features Within the Groundwater and Hydrogeology Study Area

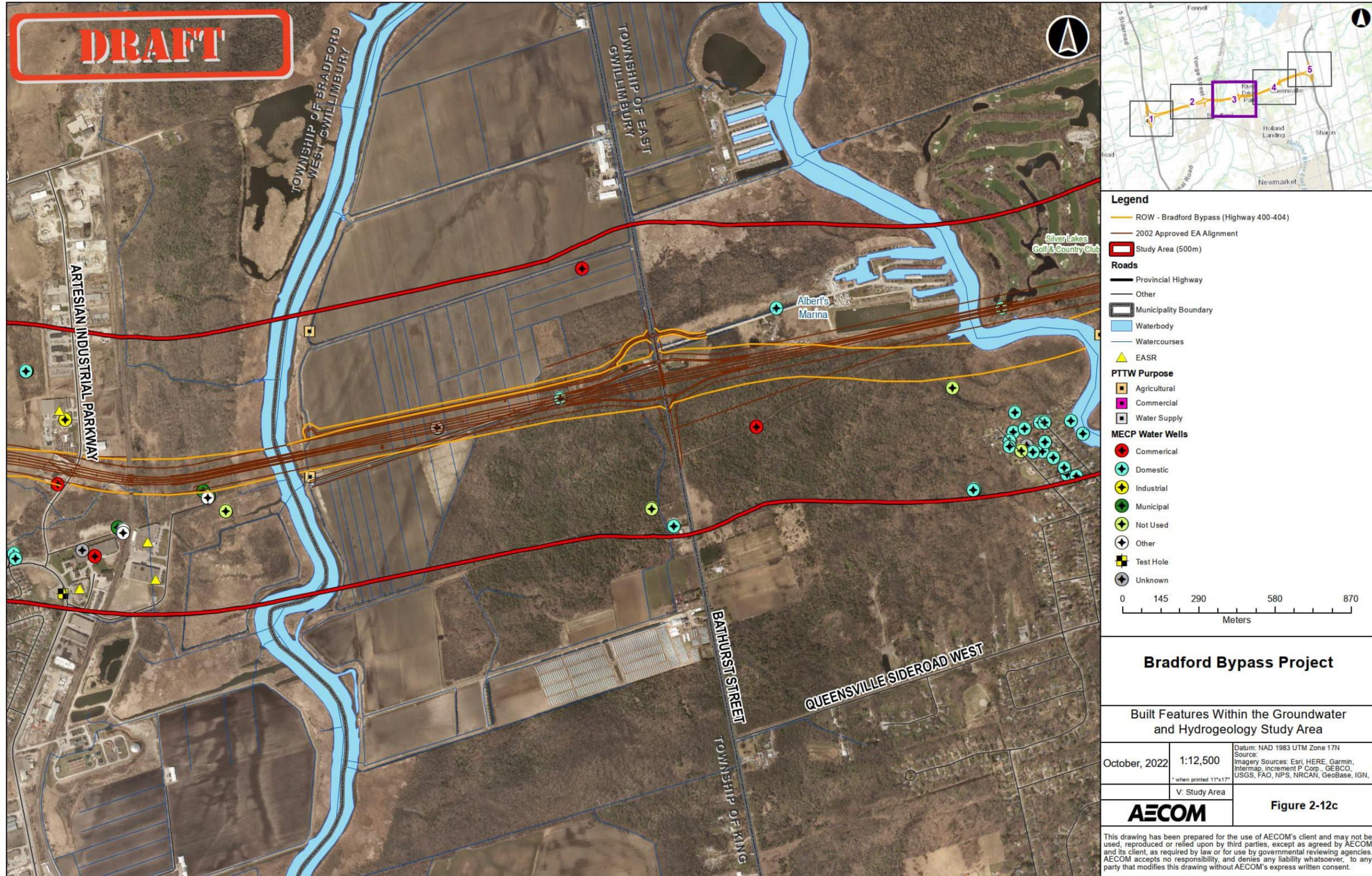


Figure 2-12d: Built Features Within the Groundwater and Hydrogeology Study Area

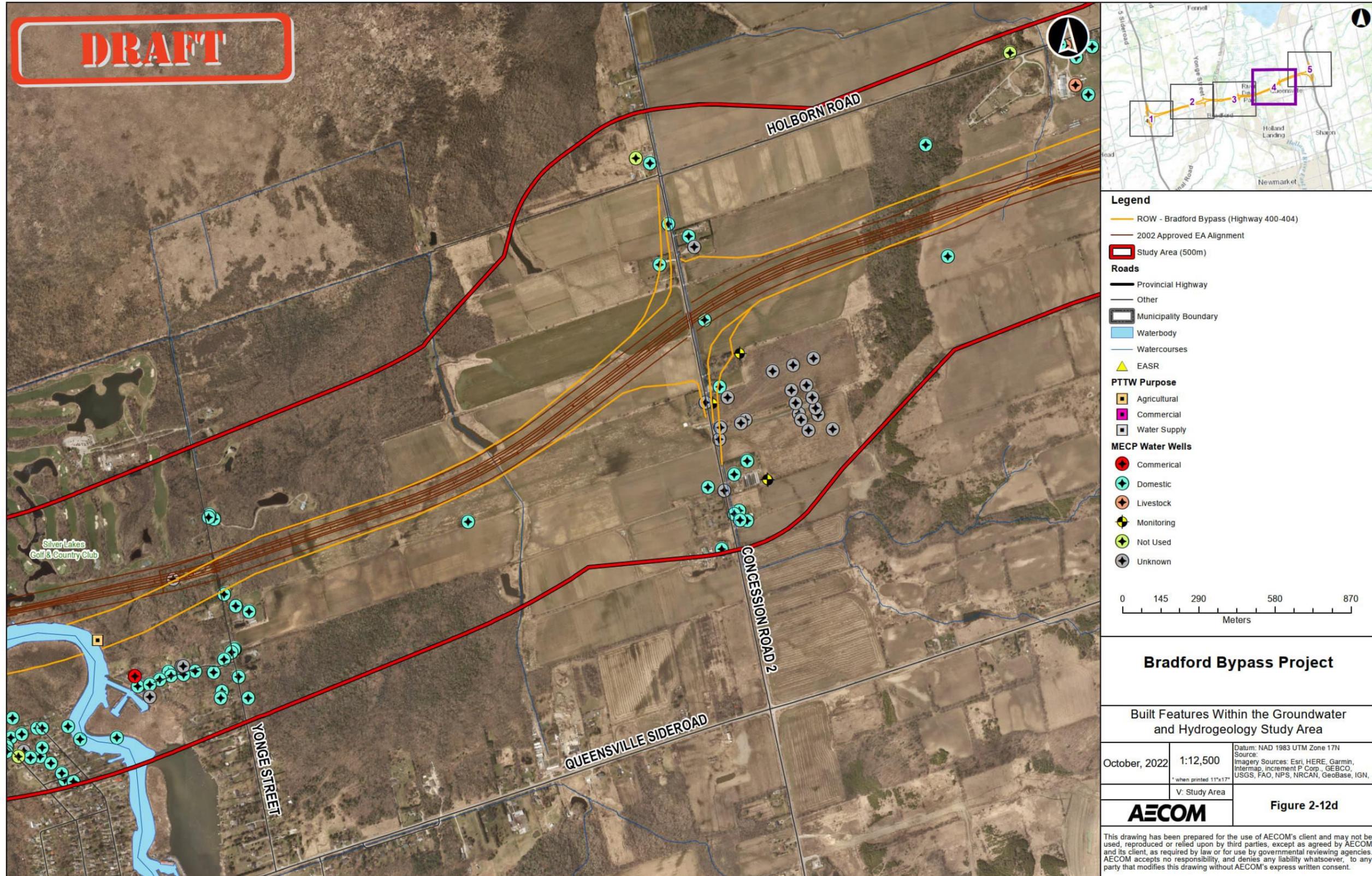
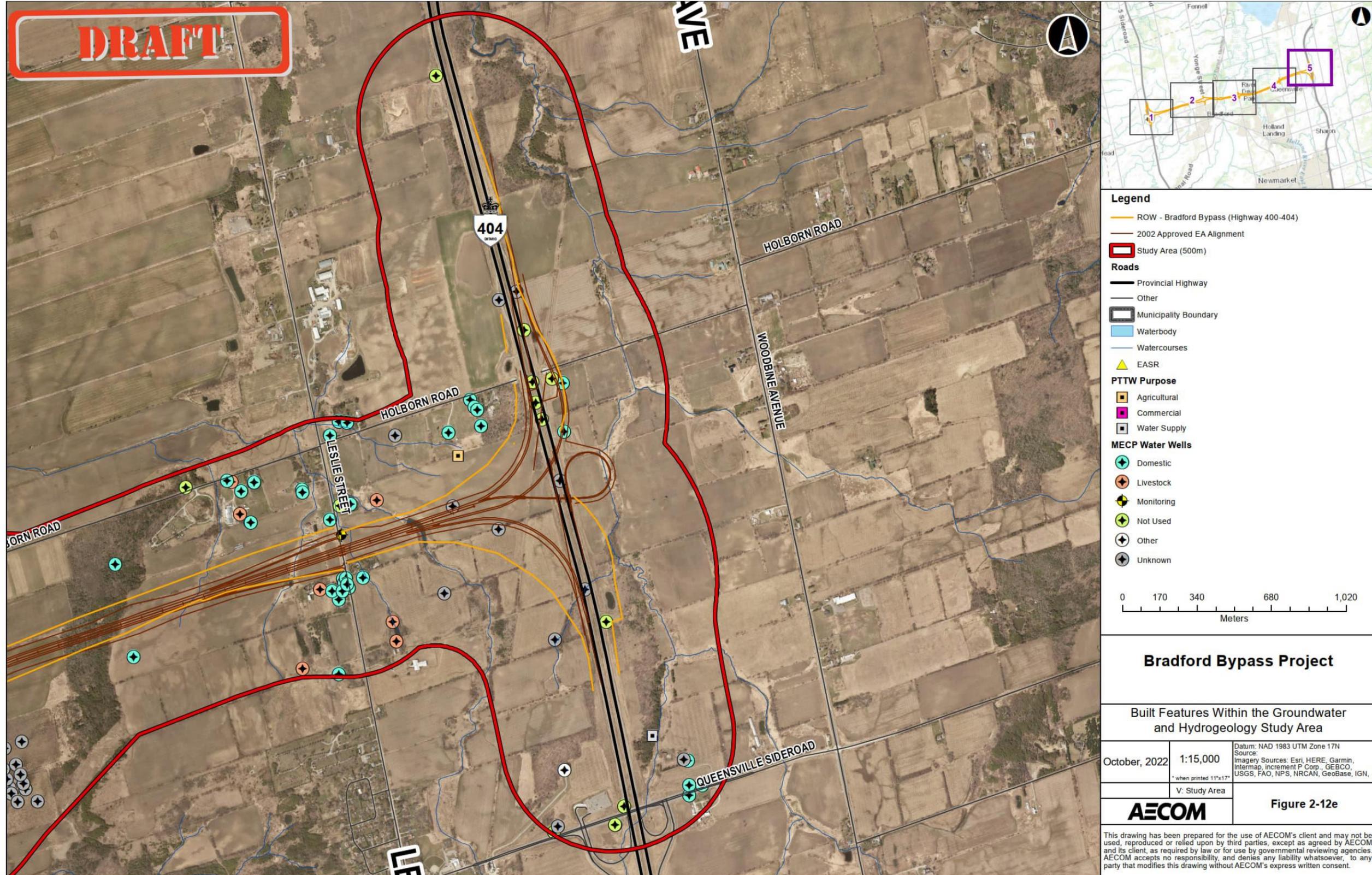


Figure 2-12e: Built Features Within the Groundwater and Hydrogeology Study Area



A review of the Ministry of the Environment, Conservation and Parks' Permit to Take Water database identified four active Permits to Take Water within the Groundwater and Hydrogeology Study Area. Note that the Permit Holder Name is not available for any of these four Permits to Take Water. A review of the Ministry of the Environment, Conservation and Parks' Environmental Activities and Sector database did not identify any active Water-Taking Environmental Activities and Sector Registry within the Groundwater and Hydrogeology Study Area. A summary of the Permit to Take Water records is provided in **Table 2-14** below.

Table 2-14: Summary of Permit to Take Water Records

Permit No.	Easting	Northing	Purpose	Specific Purpose	Max Litres per Day	Source Type
2071-BPDQUN	616434	4887505	Agricultural	Field and Pasture Crops	5,184,000	Surface Water
2558-9HTJP9	619442	4888043	Agricultural	Field and Pasture Crops	1,362,960	Surface Water
3707-BLWM8E	616433	4888056	Agricultural	Field and Pasture Crops	3,270,585	Surface Water
6538-AUQLDJ	624158	4890418	Agricultural	Field and Pasture Crops	3,815,000	Surface Water

2.1.4.3.3 Wellhead Protection Areas

Areas that are vulnerable to contamination have been delineated for active municipal wells and are known as Wellhead Protection Areas. A Wellhead Protection Areas is the area or capture zone surrounding the wellhead where land use activities have the greatest potential to affect the quality of groundwater within the aquifer from which the well derives its source. According to the Ministry of the Environment, Conservation and Parks Source Protection Information Atlas and Source Protection Assessment Report, there are no municipal water wells located within the Groundwater and Hydrogeology Study Area. Wellhead Protection Areas related to two municipal supply wells (the well locations are outside of the Groundwater and Hydrogeology Study Area) are partially located within the Groundwater and Hydrogeology Study Area, summarized below:

- Wellhead Protection Areas C1 (vulnerability score 4) and D (vulnerability score 2) are related to a municipal well located on the north side of Toll Road between Bathurst Street and Holland River, in the Township of King, Regional Municipality of York

- The Wellhead Protection Areas C1 and D are present in the Groundwater and Hydrology Study Area along Bathurst Street
- Wellhead Protection Areas B (vulnerability score 6), C (vulnerability score 2 and 6) and D (vulnerability score 2 and 4), related to a municipal well located in the northwest corner of Woodbine Avenue and Queensville Sideroad. The Wellhead Protection Areas B, C and D are present at the eastern end of the Groundwater and Hydrogeology Study Area.

In addition, a review of the Ministry of the Environment, Conservation and Parks well records indicates that the “Primary Water Use” for one well is listed as “Municipal” (Well ID 5726435). A review of the Source Protection Assessment Report and the Ministry of the Environment, Conservation and Parks Source Protection Information Atlas did not identify a municipal well and its related Wellhead Protection Areas at the mapped location on 8th Line. A Groundwater Existing Conditions Study for Bradford Bypass (W.O. #19-2001), prepared by AECOM and dated February 2020, states that the Town of Bradford West Gwillimbury confirmed that this is a former municipal well which has been decommissioned.

2.1.4.3.4 Highly Vulnerable Aquifers

Aquifer susceptibility is a measure of how easy and how fast contamination at the ground surface reaches the underlying production aquifers. The degree of groundwater susceptibility largely depends on the presence or absence of permeable surficial materials, the depth to the water table and location relative to surface water features and water wells. Generally, aquifer susceptibility is higher in areas characterized as having a shallow aquifer system and overlain by permeable surficial soil deposits. Conversely, the vulnerability of the aquifer will typically be lower where a greater thickness of fine-grained lower permeability soils is observed to cover the aquifer.

A Highly Vulnerable Aquifer is defined as an aquifer on which external sources have or are likely to have a significant adverse effect and includes the land above the aquifer (Ontario Regulation 287/07). In general, a Highly Vulnerable Aquifer consists of source granular aquifer materials or fractured rock that have a high permeability and are exposed near the ground surface with a relatively shallow water table.

Considering the presence of relatively fine-textured overburden deposits of considerable thickness, the aquifers within the Groundwater and Hydrogeology Study Area are generally considered to have a low to medium vulnerability for contamination. Higher vulnerability is expected in the areas where coarse-textured soil (i.e., sand and gravel) are present at the ground surface and where the overburden aquifers are shallow. The overburden aquifer has a higher vulnerability when compared to the bedrock aquifer.

Highly Vulnerable Aquifers have been mapped based on the Source Protection Information Atlas of Ministry of the Environment, Conservation and Parks. According to the Highly Vulnerable Aquifer map, the aquifer vulnerability underlying the majority of the eastern section of the Groundwater and Hydrogeology Study Area has been rated as Highly Vulnerable Aquifers. Highly Vulnerable Aquifers are present in the central section along the Holland River and Holland River East Branch, and in isolated areas at the western end of the Groundwater and Hydrogeology Study Area. All highly vulnerable aquifers have a vulnerability score of 6 out of 10. The Highly Vulnerable Aquifers within the Groundwater and Hydrogeology Study Area, as obtained from the Source Protection Information Atlas of Ministry of the Environment, Conservation and Parks, are presented in **Figure 2-13**. A Groundwater Impact Assessment and Stormwater Management Plan will be completed as part of the study to identify potential impacts of highway runoff and stormwater on surface water and groundwater to develop appropriate mitigation measures to protect Highly Vulnerable Aquifers.

2.1.4.3.5 Intake Protection Zones

Intake Protection Zone applies to those areas of land and water that contribute source water to a surface water drinking water system intake within a specified distance, period of flow time, and/or watershed area and within which it is desirable to regulate or monitor drinking water threats. The central portion of the Groundwater and Hydrogeology Study Area within the Holland River Watershed is located within Intake Protection Zone 3 (IPZ-3) for the Town of Bradford West Gwillimbury and surrounding communities (Ministry of the Environment, Conservation and Parks Source Water Protection Information Atlas, June 2022). Intake Protection Zone-3 is an area where modelling has shown that contaminants could be transported to a surface water intake following an extreme event.

2.1.4.3.6 Significant Groundwater Recharge Areas

Recharge areas are characterized by permeable soils exposed at the ground surface, such as sand or gravel, which allows rainwater to seep easily into the ground to recharge the underlying aquifer. A recharge area is considered significant when it helps maintain the water level in an aquifer that supplies a community with drinking water or supplies groundwater recharge to a cold-water ecosystem that is dependent on this recharge to maintain its ecological function (Ministry of the Environment, Conservation and Parks, 2007).

The presence of fine-textured overburden soil of considerable thickness limits the groundwater recharge ability, especially for the deep overburden and bedrock aquifers. Higher recharge rates are expected in the areas where coarse-textured soil (i.e., sand and gravel) are present at the ground surface and where the overburden aquifers are

shallow. As per the Significant Groundwater Recharge Areas mapping completed as part of the Source Protection Assessment Report, Significant Groundwater Recharge Areas are present in isolated areas across the Groundwater and Hydrogeology Study Area.

The Significant Groundwater Recharge Areas present in the Groundwater and Hydrogeology Study Area with their vulnerability levels, as obtained from the Source Protection Information Atlas of Ministry of the Environment, Conservation and Parks, are presented in **Figure 2-13**.

Figure 2-13a: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas Within the Groundwater and Hydrogeology Study Area

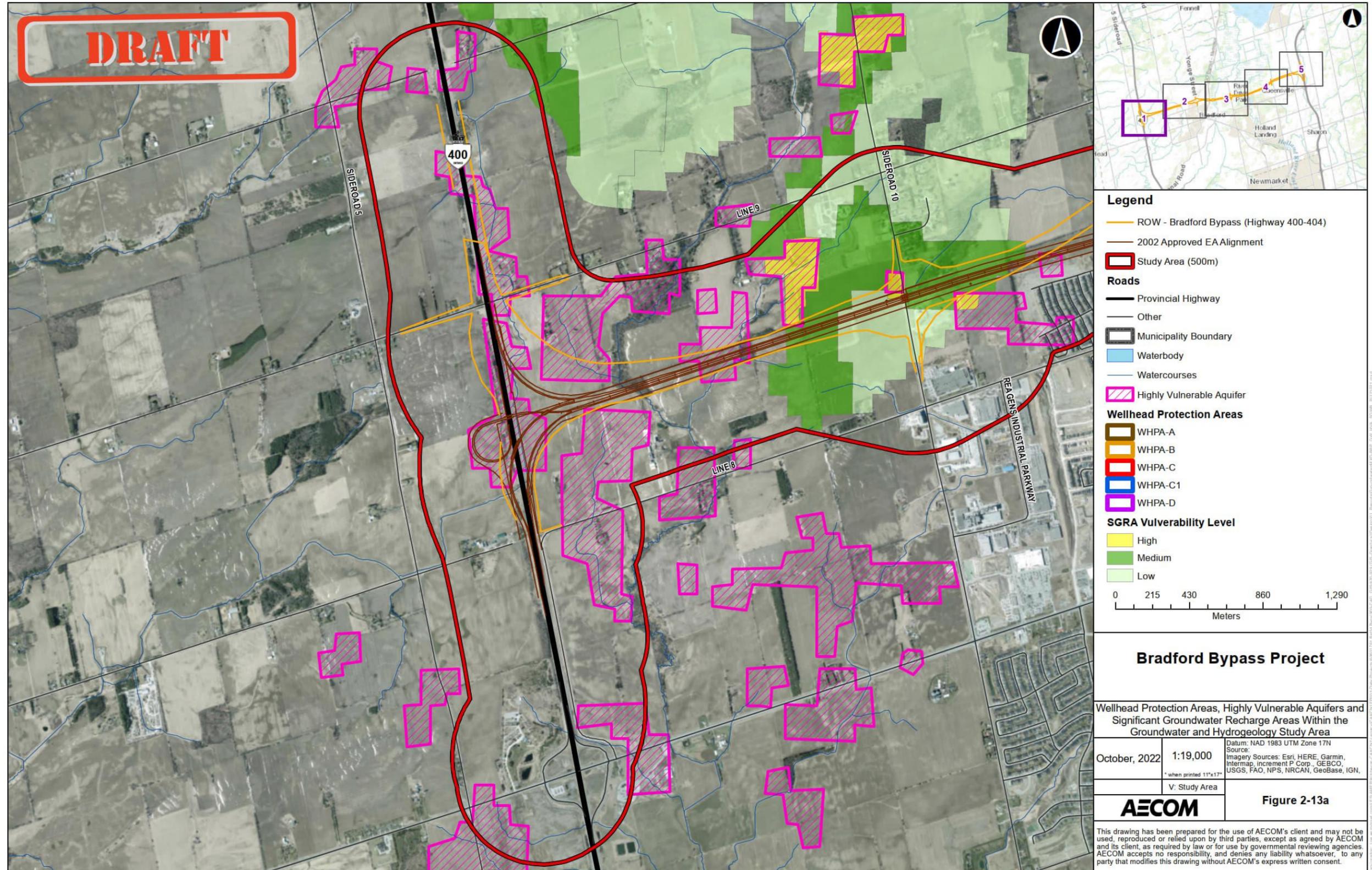


Figure 2-13b: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas Within the Groundwater and Hydrogeology Study Area

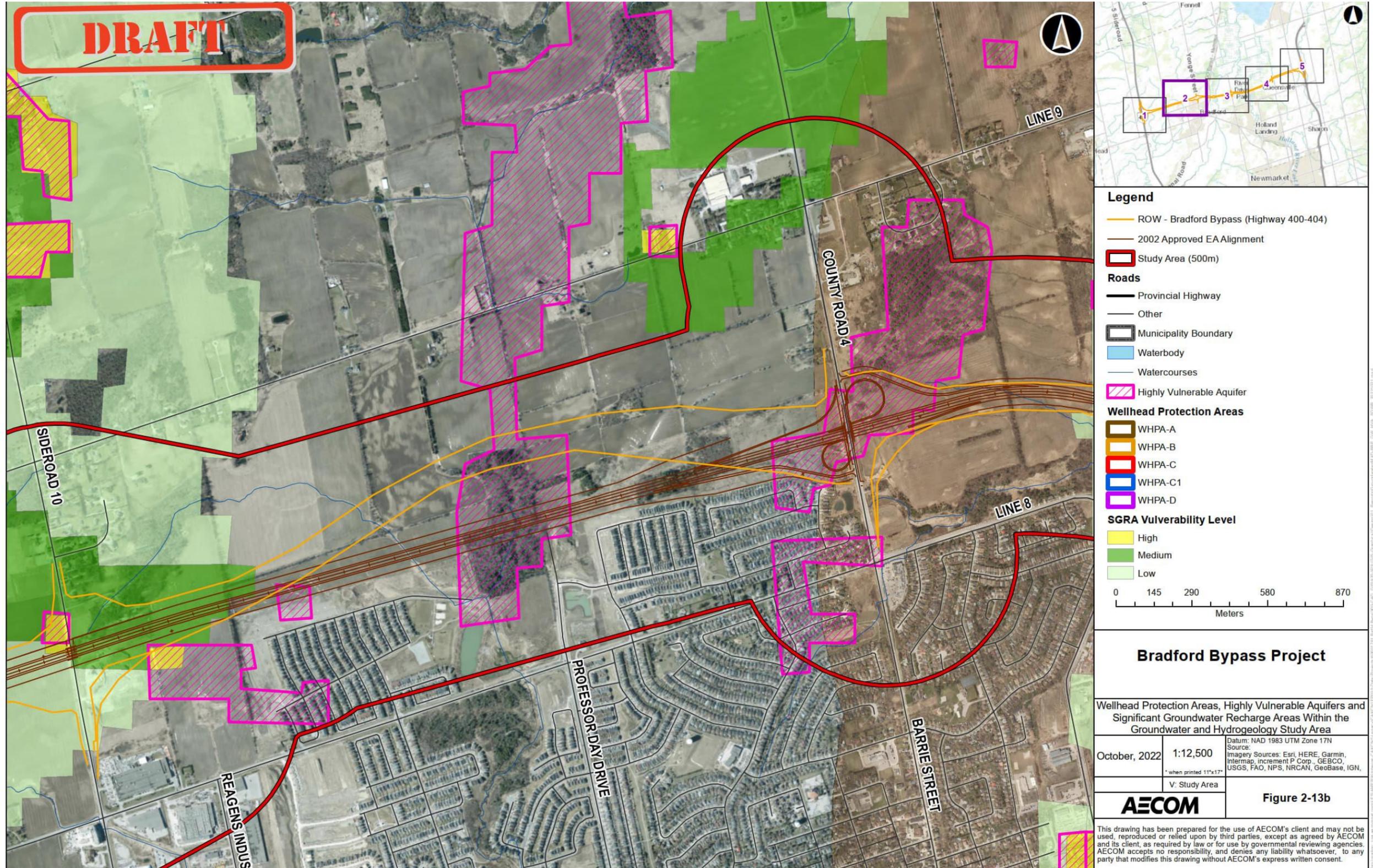


Figure 2-13c: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas Within the Groundwater and Hydrogeology Study Area

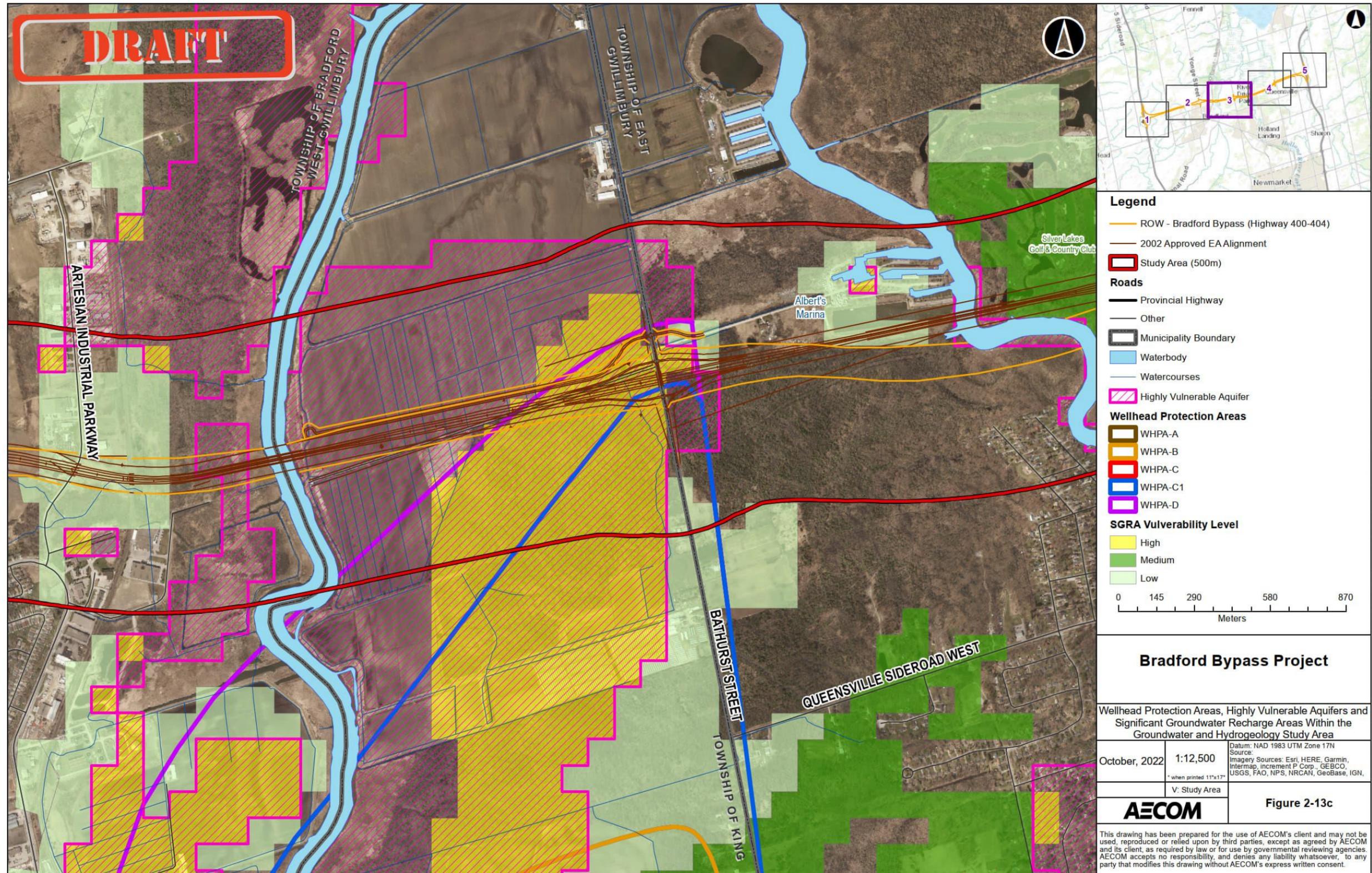


Figure 2-13d: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas Within the Groundwater and Hydrogeology Study Area

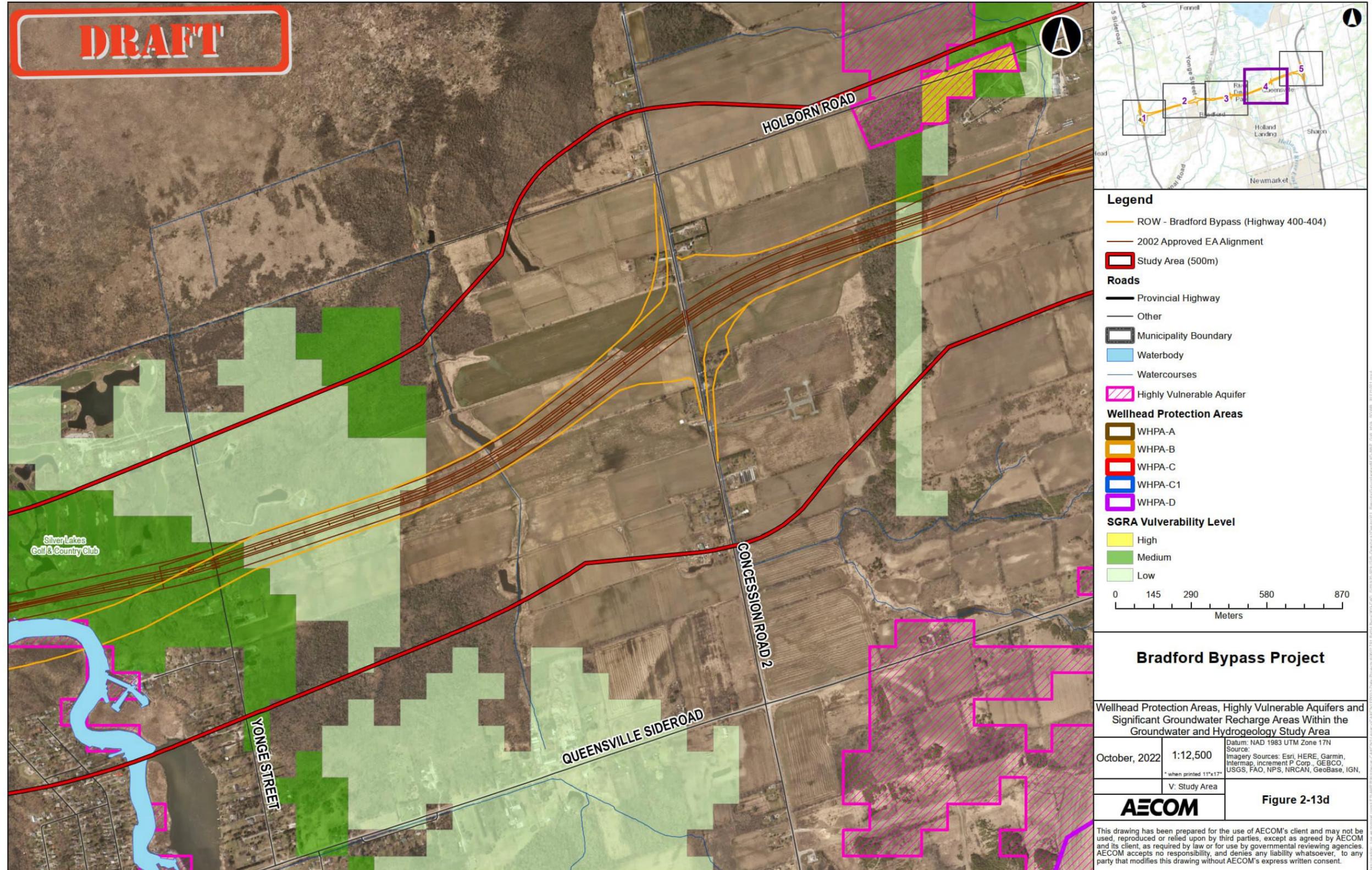
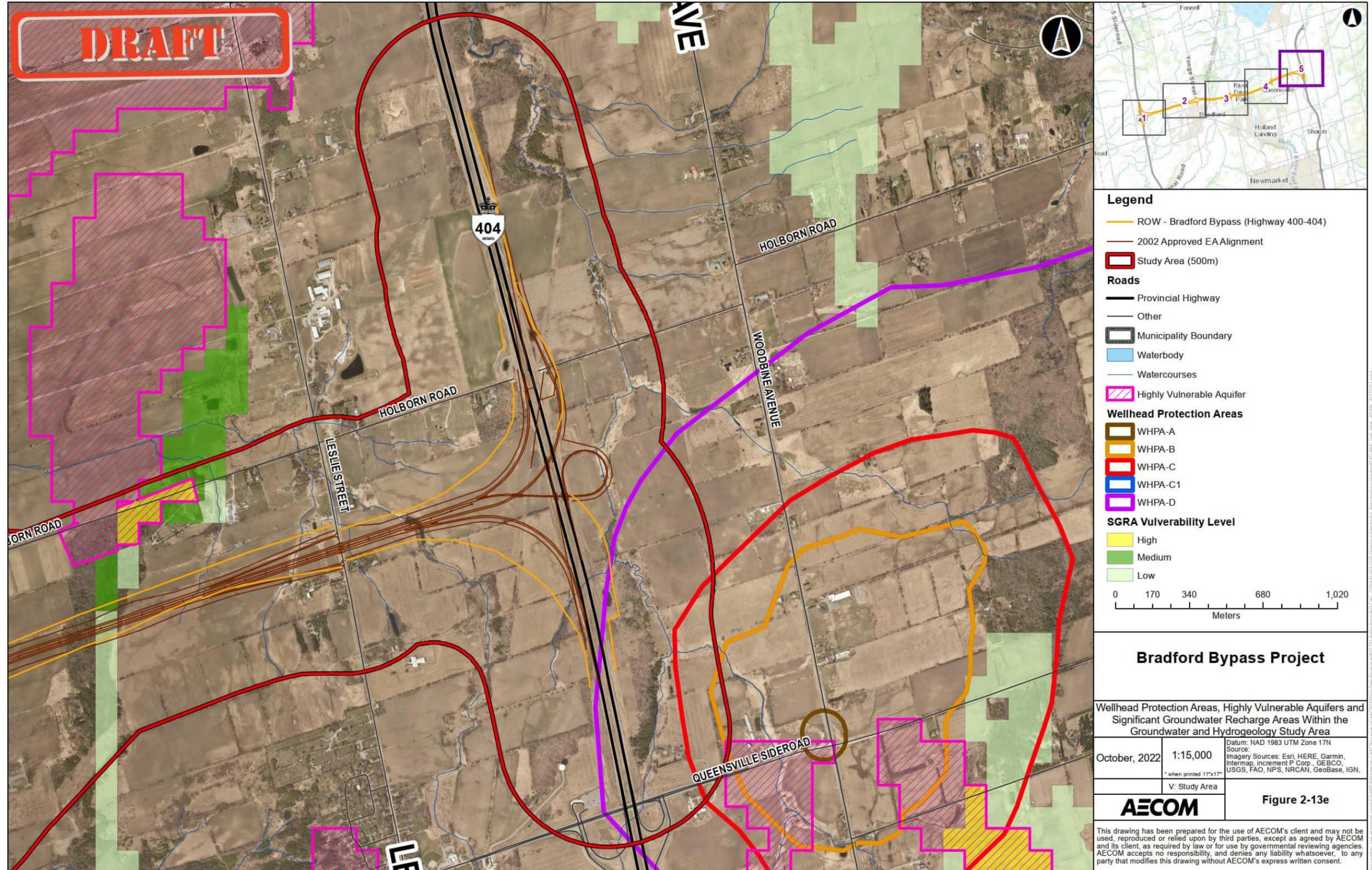


Figure 2-13e: Wellhead Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas Within the Groundwater and Hydrogeology Study Area



2.1.5 Fluvial Geomorphology

The fluvial geomorphology study characterizes geomorphological baseline conditions to provide input to the preliminary crossing designs and Environmental Impact Assessment Report, under separate cover, for the watercourses upstream and downstream of the proposed crossings. This information will provide an opportunity for the proposed design to mitigate both future erosion risk to the structures and adverse impacts on watercourses. Recommendations for the Preliminary Design will relate to the location, configuration, span, pier placement if required, and the design of the crossing structures.

The following sections outline the background, data collection and describe the reach delineation and meander belt conditions within the Fluvial Geomorphology Study Area. This technical information is part of Fluvial Geomorphology Assessment report, which is being finalized for the project once the preferred Preliminary Design has been selected. The outcome of this assessment will be presented as part of Public Information Centre #2 and presented in the Environmental Impact Assessment Report, under separate cover.

2.1.5.1 Background

A background review was conducted to better understand the Study Area and any previous inspections or assessment that have been undertaken prior to this Preliminary Design study.

The following documents were reviewed, and information extracted and cited where pertinent as part of the background review:

- LSRCA, 2010b. East Holland River Subwatershed Plan – Chapter 7 Fluvial Geomorphology
- LSRCA, 2010c. West Holland River Subwatershed Management Plan – Chapter 7 Fluvial Geomorphology
- AECOM, 2021. Fish and Fish Habitat Existing Conditions Report – FINAL Highway 400 – Highway 404 Link (Bradford Bypass)
- Ontario Ministry of Transportation, 2002. Environmental Assessment Report One - Stage Submission: Highway 400 – Highway 404 Extension Link Environmental Assessment Study
- Environmental Assessment Report One - Stage Submission: Highway 400 – Highway 404 Extension Link Environmental Assessment Study (Bradford Bypass) W.P. 377-90-00 (McCormick Rankin Corporation, 2002).

Previous geomorphological assessments were completed by Parish Geomorphic in 2007 for both the Holland River and Holland River East Subwatershed Plans available through the Lake Simcoe Region Conservation Authority. Their findings indicate that both watersheds are stable with little land use change over a 43-year period between 1959 and 2002.

For the Holland River East Branch, the Parish Geomorphic report (2007) indicates that the planform of the Holland River East Branch remained stable and did not have substantial changes from the imagery examined (1959, 1976 and 2002). However, from the intersection of Yonge Street and Mount Albert Road to south of Davis Road, the planform of the Holland River East was straight, coinciding with Newmarket's urban centre. A meander belt assessment was also completed on two reaches of the Holland River East (immediately north and south of the project). North of the project, the meander belt width falls in the range of 161-310 metres wide while south of the project the belt width is in the range of 101-160 metres.

For the Holland River, the Parish Geomorphic report (2007) evaluated 31 reaches within the Holland River subwatershed for the from summer 2005 to fall 2006 and only one reach received a Rapid Geomorphic Assessment score on "in adjustment". Thirteen reaches were determined to be "transitional" and 17 were determined to be "in regime". A list of reaches is provided, and several are located within the current Study Area. However, due to the quality of the document/reaches map (poor resolution) it can't be determined the identity of the reaches within the Study Area. Channel widening was the dominant process observed and aggradation was frequently observed on the downstream section of the watershed. The report noted that several tributaries have been channelized closer to the mouth and that agricultural practices were likely the reason. Table 7-5 within the Holland River Subwatershed Management Plan contains information of field observations and Rapid Geomorphic Assessment (RGA) and Rapid Stream Assessment Technique (RSAT) scores. A meander belt assessment was also completed on two reaches of the Holland River (immediately north and south of the project). The meander belt width for the two reaches is reported in the range of 161-310 metres wide.

Watershed characteristics for the Innisfil Creek Subwatershed, Holland River Subwatershed, Holland River East Subwatershed, and the Maskinonge River Subwatershed, were identified through a review of the background documents above and examined further through field reviews within the Study Area.

2.1.5.2 Methodology

The fluvial geomorphology assessment involved a desktop based assessment that looked at reach delineation and review of historical information.

Desktop Assessment

Reaches can be defined as lengths of the channel that display similar physical characteristics and have a setting that remains nearly constant along their length. Reaches display relative homogeneity in channel form, functions and process and are influenced by similar controlling (discharge, slope) and modifying factors (vegetation) to which the channel has become adjusted or will become adjusted to in the future.

Reach breaks within the Fluvial Geomorphology Study Area were first delineated through a desk-top assessment of tributary locations, channel gradient, geology, valley setting, sinuosity and riparian vegetation using Geographic information System layers. The reaches were subsequently confirmed in the field.

Historical aerial photographs showing each of the reaches in the vicinity of the Fluvial Geomorphology Study Area taken in 1969, 1981, and 2018 were reviewed to analyze changes in local land use and channel planform in the vicinity of the proposed crossing structures. The historical channel configurations were digitized and analyzed using Geographic Information Systems software to identify changes between 1969 and 2019.

Field Assessment

For the geomorphological reach characterization, geomorphological reach breaks were assessed. A photographic record was also completed to document channel dimensions, bank and bed materials, riparian vegetation, valley walls, and floodplain dynamics. Locations of geomorphological importance were also photographed including bank erosion sites, channel modifications, and woody material within the watercourse.

The Rapid Geomorphic Assessment was designed by the Ontario Ministry of the Environment, Conservation and Parks (formerly the Ministry of the Environment) in 1999 to assess reaches in urban channels. This technique uses visual indicators to document evidence of channel instabilities using presence/absence methodology. Stability is determined by adjustments in slope, either an increase (aggradation) due to sediment deposition or a decrease (degradation) due to bed erosion. It also considers an increase in the bank-to-bank width (widening) and by any evidence indicating adjustment in the planimetric form regime. Each of the geomorphic indicators is documented throughout the reach and upon completion is tallied by category. These data are then used to calculate an overall reach stability index which classifies the reach as 'stable', 'transitional', or 'in-adjustment' corresponding to their relative sensitivity to altered sediment and flow regimes. The classification and interpolation as defined by the factor value (total score) are identified in **Table 2-15** per the Ministry of the Environment, Conservation and Parks (2003).

Table 2-15: Rapid Geomorphic Assessment Criterion

Factor Value	Classification	Interpretation
≤0.20	■ In Regime or Stable (Least Sensitive)	■ Channel morphology is within a range of variance for streams of similar hydrographic characteristics – evidence of instability is isolated or associated with normal river propagation processes.
0.21- 0.40	■ Transitional or Stressed (Moderately Sensitive)	■ Channel morphology is within the range of variance for streams of similar hydrographic characteristics, but the evidence of instability is frequent.
≥0.41	■ In Adjustment (Most Sensitive)	■ Channel morphology is not within a range of variance and evidence of instability is widespread.

2.1.5.3 Description of Environmental Conditions

From east to west, the Fluvial Geomorphology Study Area spans through the subwatersheds of Maskinonge River at Highway 404, Holland River East Branch, Holland River, and the Innisfil Creek at Highway 400. The Maskinonge and the Holland River subwatersheds are part of the larger Lake Simcoe watershed and are under the jurisdiction of the Lake Simcoe Region Conservation Authority, whereas the Innisfil Creek subwatershed is part of the larger Nottawasaga River watershed and is under the jurisdiction of the Nottawasaga Valley Conservation Authority. The focus of the Fluvial Geomorphological Assessment are the watercourses that occur within the Fluvial Geomorphology Study Area and with reach characterizations presented in **Table 2-16** and **Table 2-17**. These are illustrated in **Figure 2-14**.

Table 2-16: Summary of Historical Assessment of Reaches in 1969, 1981 and 2018

Reach	Crossing ID	1969	1981	2018
PC-Trib-01	C10-A-3, C10-A-4	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No significant changes since 1969	■ No significant changes since 2018
PC-Trib-02	C10-A-1, C10-A-2	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ Slight change in planform east of Highway 400, feature becoming more meandering	■ Planform regaining sinuosity downstream of 9th Line
PC-Trib-03	C10-A-C	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No significant changes since 1969	■ No significant changes since 2018
PC-Trib-04	C10-A-B	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No significant changes since 1969	■ No significant changes since 2018
PC-Trib-05	C10-A-A	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No significant changes since 1969	■ No significant changes since 2018
HR-Trib-01a	C10-A-6	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No significant changes since 1969	■ No significant changes since 2018
HR-Trib-01	C10-C-2	■ Evidence of straightening prior to 1969	■ Feature appears to be regaining sinuosity	■ Improvement in riparian vegetation. Agricultural buildings and warehouses appear after 1981 close to the right bank of the feature. Feature appears to continue gaining sinuosity.
HR-Trib-02	C10-B-1, C10-B-2	■ Feature cannot be located on aerial photograph	■ Feature cannot be located on aerial photograph	■ Feature cannot be located on aerial photograph
HR-Trib-03	C10-C-1	■ Upstream of 9th Line straightened prior to 1969. Downstream of 9th Line feature shows a natural meandering planform. Dense vegetation limits analysis.	■ Feature appears to be regaining sinuosity since 1969. Dense vegetation limits analysis.	■ Appears more meandering but increasing riparian vegetation density limits analysis. Upstream of 9th Line the riparian vegetation has increased in density.
HR-Trib-04	C11-A-1	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ No evidence of changes in planform since 1969	■ No evidence of changes in planform since 1981
HR-Trib-05	C11-A-2	■ Feature cannot be located on aerial photograph	■ Feature cannot be located on aerial photograph	■ Feature cannot be located on aerial photograph
HR-Trib-06	C11-A-1	■ Straightened prior to 1969, low sinuosity visible, agricultural activity adjacent to feature	■ Increase in feature sinuosity.	■ Increase in feature sinuosity. Riparian vegetation cover on left bank has improved
HR-Trib-07	C12-A-1	■ Limited visibility due to imagery quality and vegetation cover	■ Little evidence of changes in planform since 1969. An access road over upstream portion the feature appeared prior to 1981.	■ No significant changes since 1981. Vegetation cover has increased.
HR-Trib-08	C13-A-1	■ Straightened prior to 1969, agricultural activity adjacent to feature	■ Little evidence of changes in planform since 1969	■ Upstream and downstream portion of the feature remain straight. Central portion of the feature appears to have regained a natural meandering planform since 1981. A residential development is present south of the feature and stormwater pond downstream of the feature appeared prior to 2018.
HR-Trib-09	C14-A-1	■ The feature's analysis is limited by the presence of vegetation cover. The planform appears to be natural and meandering	■ Little evidence of changes in planform since 1969	■ Little evidence of changes in planform since 1969, surrounding vegetation has developed into a dense woodlot.
HR-Trib-10	C16-A-2 C16-A-3	■ Ephemeral feature only visible by shading, adjacent agricultural activities	■ Little evidence of changes in planform since 1969	■ Little evidence of changes in planform since 1981

Reach	Crossing ID	1969	1981	2018
HR-Trib-11	C16-A-1	■ Natural meandering feature. No signs of alteration other than a train track crossing prior to 1969.	■ No apparent changes since 1969. Increase in vegetation cover limits the analysis of the feature.	■ Feature appears to remain with a natural meandering planform. Vegetation cover limits the analysis of the feature.
HR-Trib-12	C17-B-1	■ Agricultural drainage feature	■ No apparent changes since 1969	■ No apparent changes since 1981
UD-1 to UD-13	C17-C-1, C17-D-1, C17-E-1, C17-F-1, C18-A-1, C18-B-1, C18-C-1, C18-E-1, C18-F-1, C18-G-1, C18-H-1, C23-A-1	■ Agricultural drainage network implemented prior to 1969	■ No apparent changes since 1969	■ No apparent changes since 1981
HREB-Trib-01	C22-A-1	■ Feature only visible by shading. Straight planform surrounded by agricultural land. Minimal riparian zone.	■ No significant changes visible since 1969.	■ Feature remains with a straight planform and minimal riparian zone.
UT-01	C24-A-1	■ Ephemeral feature only visible by shading. Agricultural activities adjacent to the feature taking place prior to 1969	■ No apparent changes since 1969	■ No apparent changes since 1981, feature is becoming less visible.
UT-02	C25-A-1	■ Not visible in 1969 historical imagery.	■ Straightened planform, surrounded by agricultural activities. A warehouse is located on the downstream portion of the feature on the right bank.	■ No apparent changes in planform since 1981.
UT-03	C25-B-1	■ Not visible in 1969 historical imagery.	■ Straightened planform, surrounded by agricultural activities.	■ A residential dwelling appeared on the path of the feature prior to 2018. Other notable change is a small increase in riparian vegetation in the upstream portion, just downstream of the pond. The feature's planform remains straightened.
UT-04	C25-C-1	■ Not visible in 1969 historical imagery.	■ Slightly meandering planform affected by agricultural activities	■ No apparent changes in planform since 1981. Riparian vegetation cover has increased.
UT-05	C25-C-1	■ Not clearly visible	■ Not clearly visible	■ Not historical data available prior to 1981. Feature is presumably used for irrigation purposes.
UT-06	C25-C-1	■ Evidence of straightening prior to 1969	■ Feature appears to be regaining sinuosity	■ Decrease in sinuosity, especially along lower half of reach, possibly suggesting straightening between 1981 and 2018
MR-Trib-02a	C25-A-2 C26-A-2	■ The feature is not clearly visible from the aerial imagery	■ The feature appears more visible on the landscape as it flows through agricultural land. The channel appears linearized; however, the feature's corridor appears sinuous	■ In 2011 the feature appears to have been realigned during the construction of the Highway 404/Queensville Sideroad interchange. After the construction of the interchange the flows from southwest to northeast of Highway 404 under four crossings.
MR-Trib-01	C25-A-2 C26-A-2	■ Only visible by shading. Surrounded by agricultural activity, evidence of planform straightening.	■ Slight improvement in reach sinuosity since 1969. No other visible changes reported	■ Major disruption has been the construction of Highway 404. The riparian vegetation of the reach has seen significant recovery from the impacts of agriculture since 1969. The reach has regained sinuosity.

Reach	Crossing ID	1969	1981	2018
MR-Trib-02	C25-A-2, C26-A-2	<ul style="list-style-type: none"> Only visible by shading. Surrounded by agricultural activity. Slightly meandering planform. 	<ul style="list-style-type: none"> Notable improvement in channel sinuosity. Riparian zone displays increases in vegetation 	<ul style="list-style-type: none"> Vegetation cover has also improved as the agricultural fields have left more room for the riparian zone surrounding the feature.
MR-Trib-03	C25-A-2, C26-A-2	<ul style="list-style-type: none"> Surrounded by agricultural activity, evidence of planform straightening. 	<ul style="list-style-type: none"> Increase in feature sinuosity 	<ul style="list-style-type: none"> Improvements to riparian vegetation density. Agricultural fields abandoned or tilled further away from the riparian areas. Little or no changes to channel planform.
HR-01	C17-A-1	<ul style="list-style-type: none"> Holland River, natural meandering planform. Agricultural activities adjacent to right bank present prior to 1969. 	<ul style="list-style-type: none"> No significant changes in channel planform since 1969 	<ul style="list-style-type: none"> No major changes in channel planform. Residential developments appear on left bank prior to 2018. Evidence of erosion along right bank of the inner meander upstream of the proposed crossing.
HREB-01	C20-A-1 C20-B-1	<ul style="list-style-type: none"> Holland River East Branch. A residential development on the left bank of the feature (north and south of Queensville Sideroad West) is present prior to 1969. Also prior to 1969, a boat marina is present on the left bank, east of Bathurst Street and a second marina is present on the right bank, at the end of Morgans Road. 	<ul style="list-style-type: none"> Boat marina on the left bank, off Bathurst St. substantially increased in size since 1969. Further downstream, also on the left bank and north, a large boat marina has been carved on the feature's left bank. 	<ul style="list-style-type: none"> Prior to 2018, a large golf course development took place on the right bank of the feature (north of Morgans Road.). Despite changes in land use on the feature's banks and floodplain, its meandering planform relatively remains unchanged. The only visible evidence of erosion is recession of the outer meanders downstream of the proposed crossing.

Table 2-17: Summary of Reach Selection Justifications

Reach	Crossing ID	Upstream Boundary Reason	Upstream Boundary Co-ordinates	Downstream Boundary Reason	Downstream Boundary Co-ordinates	Hydraulic Regime
PC-Trib-01	C10-A-3 C10-A-4	■ Confluence of agricultural drains. Agricultural fields upstream of reach break before becoming more channelized adjacent to Highway 400.	44.1098° -79.6434°	■ Change in planform. Downstream of reach break feature becomes more sinuous	44.1182° -79.6348°	■ Permanent
PC-Trib-02	C10-A-1 C10-A-2	■ Change in planform. Downstream of reach break feature becomes more sinuous	44.1182° -79.6348°	■ Change in planform. Feature becomes straightened upstream of road crossing.	44.1242° -79.6357°	■ Permanent
PC-Trib-03	C10-A-C	■ Change in planform. Downstream of reach break feature becomes more sinuous	44.1241° -79.6357°	■ Change in planform and confluence. Downstream of reach break the feature becomes less sinuous	44.1292° -79.6363°	■ Permanent
PC-Trib-04	C10-A-B	■ PC-Trib-03 splits into PC-trib-04 and another feature.	44.1292° -79.6363°	■ Change in riparian vegetation. Scrubland and forest land before reach break, agricultural crops after reach break	44.1300° -79.6391°	■ Intermittent
PC-Trib-05	C10-A-A	■ Confluence of two features	44.1336° -79.6376°	■ Change in riparian vegetation. Scrubland and forest land before reach break, agricultural crops after reach break	44.1345° -79.6390°	■ Ephemeral
HR-Trib-01a	C10-A-6	■ Change in planform. Downstream of reach break the feature becomes a straightened drainage channel	44.1027° -79.6319°	■ Change in planform. Downstream of reach break the feature is no longer a straightened drainage channel	44.1015° -79.6317°	■ Ephemeral
HR-Trib-01	C10-C-2	■ Upstream reach loses sinuosity and divides into HR-Trib-01 and HR-Trib-04	44.1174° -79.6222°	■ HR-Trib-01 divides into HR-Trib-03 and HR-Trib-02	44.1201° -79.6274°	■ Intermittent
HR-Trib-02	C10-B-1 C10-B-2	■ HR-Trib-01 divides into HR-Trib-02 and HR-Trib-03	44.1201° -79.6274°	■ Drainage swale in an actively farmed agricultural field.	44.1249° -79.6303°	■ Ephemeral
HR-Trib-03	C10-C-1	■ Change in riparian vegetation. Woodlot downstream of reach break and agricultural fields upstream. HR-Trib-01 divides into HR-Trib-02 and HR-Trib-03	44.1201° -79.6274°	■ Change in planform and riparian vegetation. Feature regains sinuosity. Woodlot upstream of reach break and agricultural fields downstream.	44.1299° -79.6191°	■ Intermittent/ Permanent
HR-Trib-04	C11-A-1	■ Upstream reach loses sinuosity and divides into HR-Trib-01 and HR-Trib-04	44.1174° -79.6222°	■ Change in riparian vegetation and confluence of HR-Trib-04 and HR-Trib-05 into HR-Trib-06. Agricultural fields upstream of reach break and woodlot downstream.	44.1209° -79.6184°	■ Intermittent
HR-Trib-05	C11-A-2	■ Confluence of agricultural drains into swale-type feature	44.1209° -79.6184°	■ Change in planform. Feature transitions from a farm field drainage swale at the upslope end and then drains into HR-Trib-06	44.1205° -79.6156°	■ Ephemeral
HR-Trib-06	C11-A-2	■ Change in riparian vegetation and confluence of HR-Trib-04 and HR-Trib-05 into HR-Trib-06. Agricultural fields upstream of reach break and woodlot downstream.	44.1209° -79.6184°	■ Change in riparian vegetation. Woodlot upstream of reach break. Agricultural fields downstream. Channel enters farm fields and becomes a channelized drainage swale between farm fields	44.1232° -79.6173°	■ Permanent
HR-Trib-07	C12-A-1	■ Confluence of agricultural drains from agricultural fields into woodlot	44.1245° -79.6058°	■ Change in riparian vegetation. Woodlot upstream of reach break and agricultural fields downstream	44.1292° -79.5996°	■ Ephemeral
HR-Trib-08	C13-A-1	■ Natural swale feature through meadow and agricultural field. Channel originated from hedgerow upstream to the North and enters scrubland to the south with sparse scrubs and trees	44.1292° -79.5943°	■ Confluence of HR-Trib-08 with another tributary into HR-Trib-09. Change in riparian vegetation. Agricultural fields upstream of reach break and woodlot downstream.	44.1256° -79.5867°	■ Ephemeral

Reach	Crossing ID	Upstream Boundary Reason	Upstream Boundary Co-ordinates	Downstream Boundary Reason	Downstream Boundary Co-ordinates	Hydraulic Regime
HR-Trib-09	C14-A-1	■ Confluence of HR-Trib-08 with another tributary into HR-Trib-09. Change in riparian vegetation. Agricultural fields upstream of reach break and woodlot downstream.	44.1256° -79.5867°	■ Change in planform. Feature transitions into a drainage swale	44.1291° -79.5854°	■ Ephemeral
HR-Trib-10	C16-A-2 C16-A-3	■ Confluence of agricultural drains. Agricultural swale	44.1327° -79.5654°	■ Confluence of HR-Trib-10 and another reach into HR-Trib-11. Change in riparian vegetation. Woodlot downstream of reach break. Agricultural fields upstream.	44.1300° -79.5562°	■ Ephemeral
HR-Trib-11	C16-A-1	■ Confluence of HR-Trib-10 and another reach into HR-Trib-11. Change in riparian vegetation. Woodlot downstream of reach break. Agricultural fields upstream.	44.1300° -79.5562°	■ Change in planform. Feature drains into larger HR-01 feature	44.1302° -79.5517°	■ Permanent
HR-Trib-12	C17-B-1	■ Confluence of agricultural drains into a channelized feature	44.1358° -79.5445°	■ Drains South into the Holland River	44.1313° -79.5446°	■ Permanent
UD-01	C17-C-1	■ Channelized agricultural drain	44.1363° -79.5416°	■ Confluence with UD-09	44.1324° -79.5406°	■ Ephemeral
UD-02	C17-D-1	■ Channelized agricultural drain	44.1365° -79.5409°	■ Confluence with UD-09	44.1325° -79.5399°	■ Ephemeral
UD-03	C17-E-1	■ Channelized agricultural drain	44.1366° -79.5405°	■ Confluence with UD-09	44.1326° -79.5394°	■ Ephemeral
UD-04	C17-F-1	■ Channelized agricultural drain	44.1367° -79.5399°	■ Confluence with UD-09	44.1327° -79.5389°	■ Ephemeral
UD-05	C18-A-1	■ Channelized agricultural drain	44.1346° -79.5383°	■ Confluence with UD-09	44.1329° -79.5379°	■ Ephemeral
UD-06	C18-B-1	■ Channelized agricultural drain	44.1348° -79.5373°	■ Confluence with UD-09	44.1331° -79.5369°	■ Ephemeral
UD-07	No crossing ID	■ Channelized agricultural drain	44.135° -79.5364°	■ Confluence with UD-09	44.1333° -79.5359°	■ Ephemeral
UD-08	C18-C-1	■ Channelized agricultural drain	44.1353° -79.5354°	■ Confluence with UD-09	44.1334° -79.5349°	■ Ephemeral
UD-09	C18-E-1	■ Confluence of agricultural drains	44.1347° -79.5293°	■ Drains into the Holland River	44.1314° -79.5446°	■ Ephemeral
UD-10	C18-G-1	■ Roadside drainage ditch through forested area	44.1285° -79.5273°	■ Drains North into UD-09 where the planform changes. Forested area upstream of reach break and agricultural drainage downstream	44.1344° -79.5301°	■ Ephemeral
UD-11	C18-F-1	■ Confluence of roadside ditches	44.1347° -79.5293°	■ Change in planform. Drains north into another agricultural drain through forest and agricultural fields until confluence with Holland River	44.1377° -79.5286°	■ Intermittent/ Permanent

Reach	Crossing ID	Upstream Boundary Reason	Upstream Boundary Co-ordinates	Downstream Boundary Reason	Downstream Boundary Co-ordinates	Hydraulic Regime
UD-12	C18-H-1	■ Confluence of roadside ditches	44.1366° -79.5237°	■ Drains into the Holland River	44.1380° -79.5284°	■ Ephemeral
UD-13	C23-A-1	■ Confluence of roadside ditches and agricultural drains	44.145° -79.4779°	■ Ephemeral ponded water	44.1476° -79.4786°	■ Ephemeral
HREB-Trib-01	C22-A-1	■ Change in riparian vegetation. Woodlot upstream of reach break. Agricultural fields downstream.	44.1382° -79.4867°	■ Change in riparian vegetation. Woodlot downstream of reach break and feature develops into ponded water. Agricultural fields upstream.	44.1419° -79.4879°	■ Permanent
UT-01	C24-A-1	■ Undefined vegetation-controlled channel with confluence from agricultural drains	44.1498° -79.4635°	■ Change in planform. Regains sinuosity	44.1534° -79.4611°	■ Ephemeral
UT-02	C25-A-1	■ Undefined vegetation-controlled channel with confluence from agricultural drains	44.1560° -79.4560°	■ Confluence of UT-02 with UT-04	44.1479° -79.4557°	■ Ephemeral
UT-03	C25-B-1	■ Undefined vegetation-controlled channel with confluence from agricultural drains	44.1499° -79.4510°	■ Confluence of UT-03 with UT-04	44.1553° -79.4546°	■ Ephemeral
UT-04	C25-C-1	■ Confluence of UT-02 and UT-03 with UT-04	44.1479° -79.4557°	■ Change in planform. Water pools and forms a pond	44.1538° -79.4504°	■ Ephemeral
UT-05	C25-C-1	■ Change in planform. Water pools and forms a pond	44.1538° -79.4504°	■ Change in planform. Feature becomes a defined channel again	44.1527° -79.4493°	■ Pond
UT-06	C25-C-1	■ Change in planform. Feature becomes a defined channel again	44.1527° -79.4493°	■ Change in planform. Gains sinuosity. Change in riparian vegetation. Agricultural fields downstream of reach break and woodlot upstream.	44.1513° -79.4470°	■ Permanent
MR-Trib-02a	C28-A-1	■ Change in riparian vegetation. From woodlot upstream to grasses downstream of break	44.1383° -79.4388°	■ On-line pond inlet	44.1481° -79.1481°	■ Intermittent
MR-Trib-01	C25-A-2 C26-A-1	■ Confluence of agricultural drains into a headwater feature	44.1469° -79.4416°	■ Confluence of MR-Trib-01 and MR-Trib-02	44.1524° -79.4385°	■ Intermittent
MR-Trib-02	C26-A-1	■ Confluence of two reaches into MR-Trib-02	44.1482° -79.4351°	■ Change in planform. watercourse loses sinuosity	44.1524° -79.4385°	■ Permanent
MR-Trib-03	C26-A-1	■ Confluence of MR-Trib-01 and MR-Trib-02	44.1524° -79.4385° -79.4403°	■ Change in planform. Gains sinuosity	44.1589° -79.4371° -79.4422°	■ Permanent
HR-01	C17-A-1	■ Confluence	44.1121° -79.5461°	■ Confluence present downstream	44.1479° -79.5394°	■ Permanent
HREB-01	C20-A-1 C20-B-1	■ Change in adjacent land use and riparian vegetation. From residential to woodlot type	44.1332° -79.5077°	■ Change in riparian vegetation from mix of woodlot and recreational to agricultural and meadow type	44.1472° -79.5220°	■ Permanent

Figure 2-14a: Fluvial Geomorphology Reaches

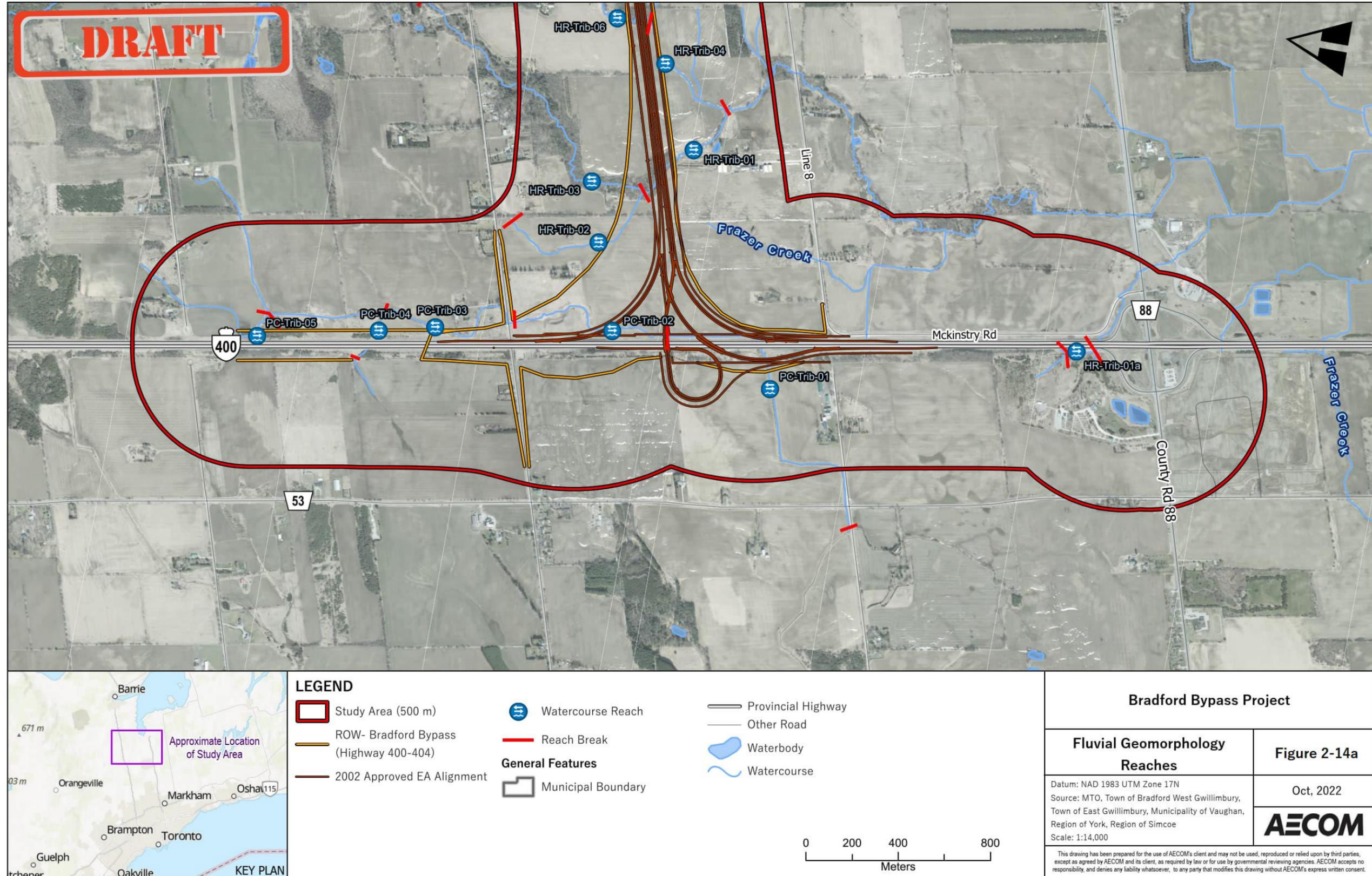


Figure 2-14b: Fluvial Geomorphology Reaches

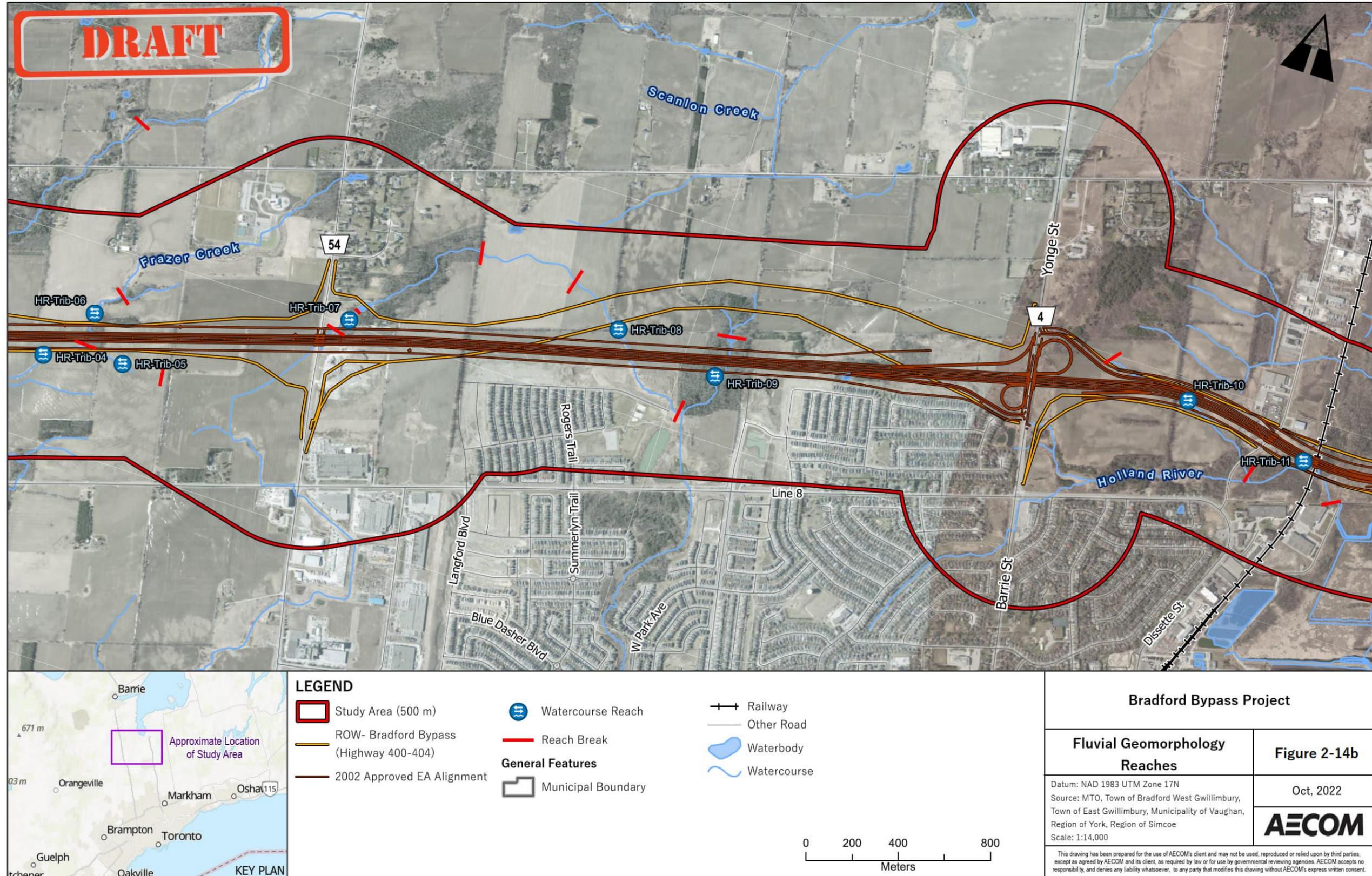


Figure 2-14c: Fluvial Geomorphology Reaches

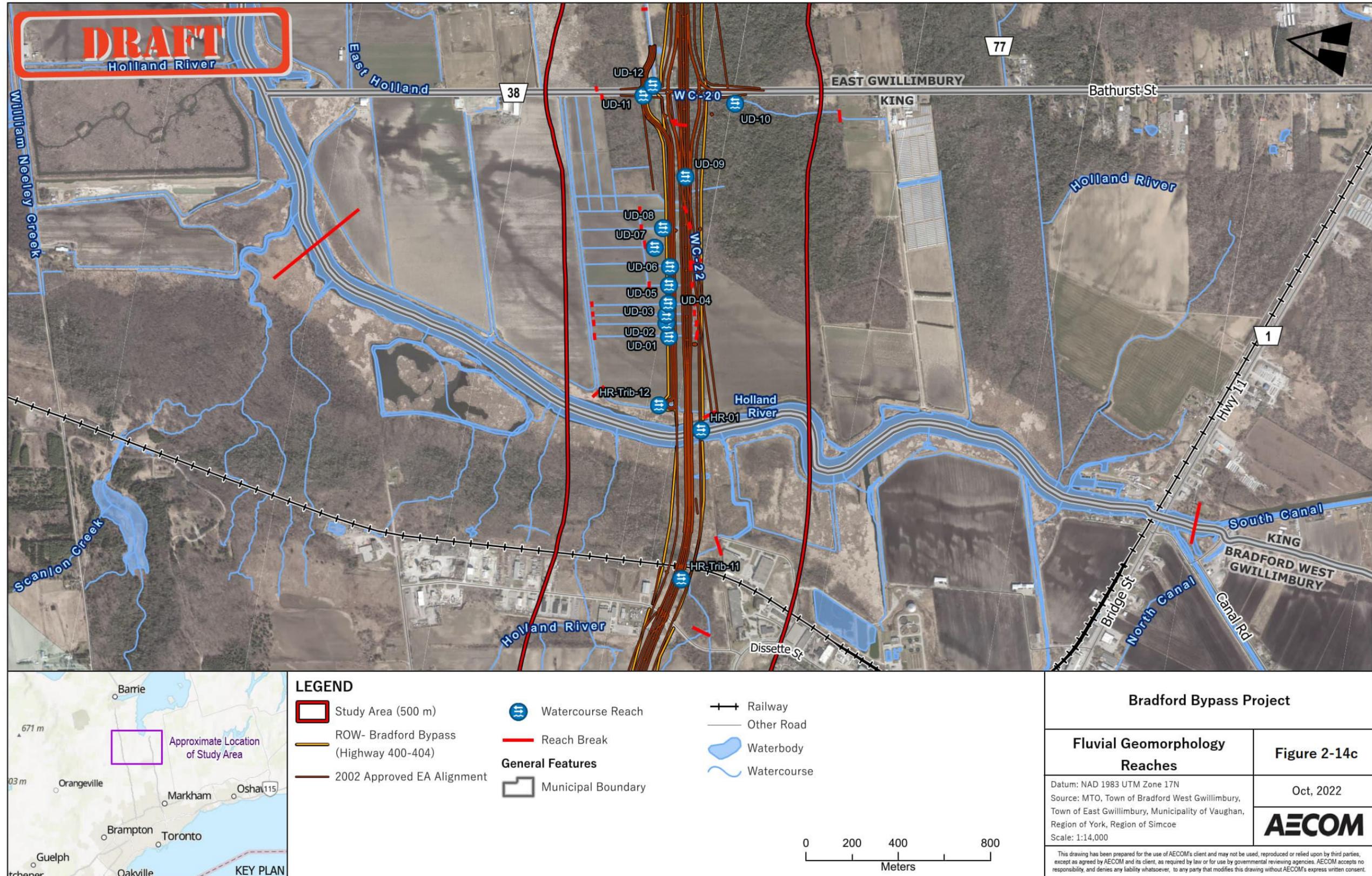


Figure 2-14d: Fluvial Geomorphology Reaches

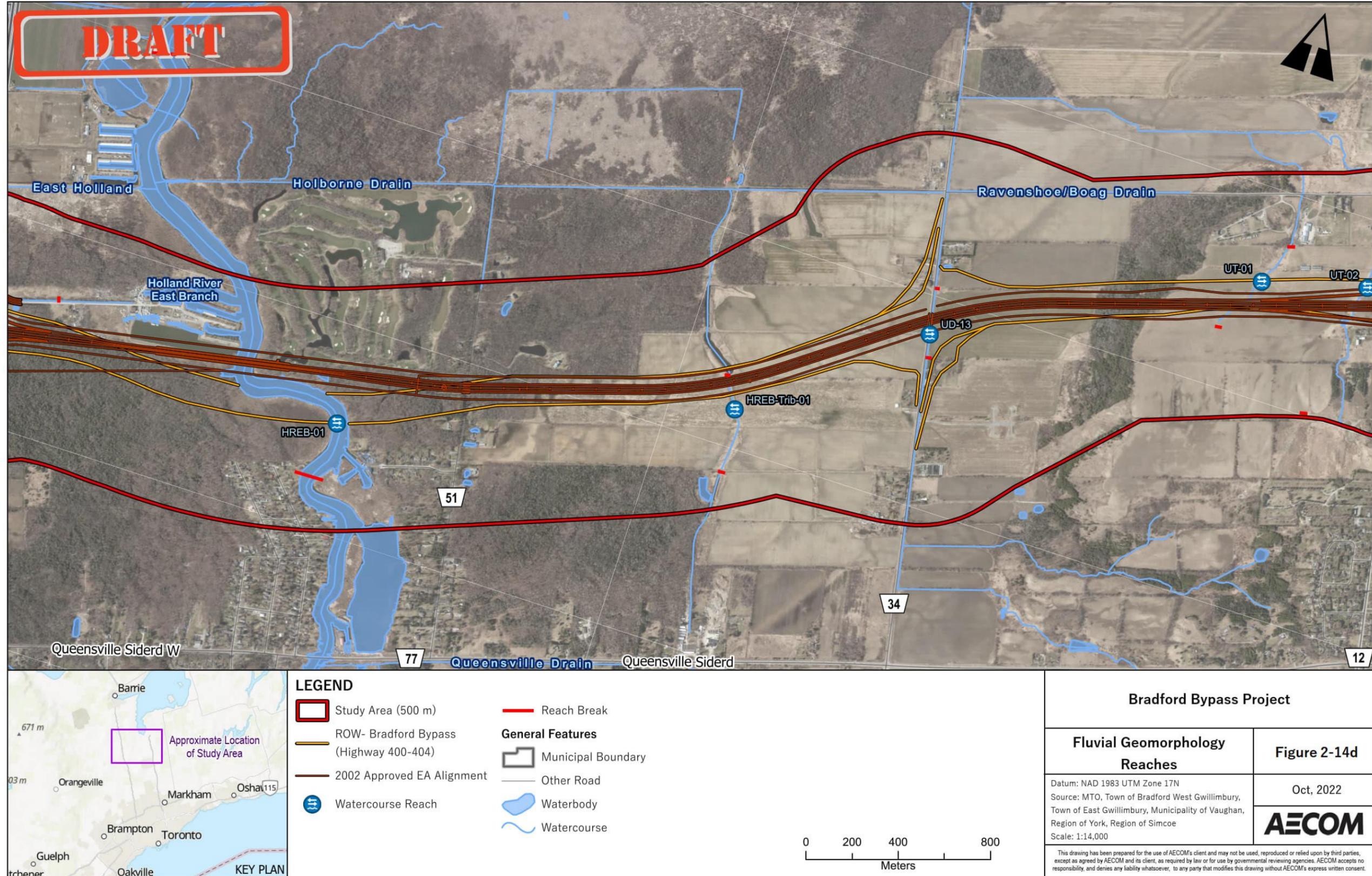
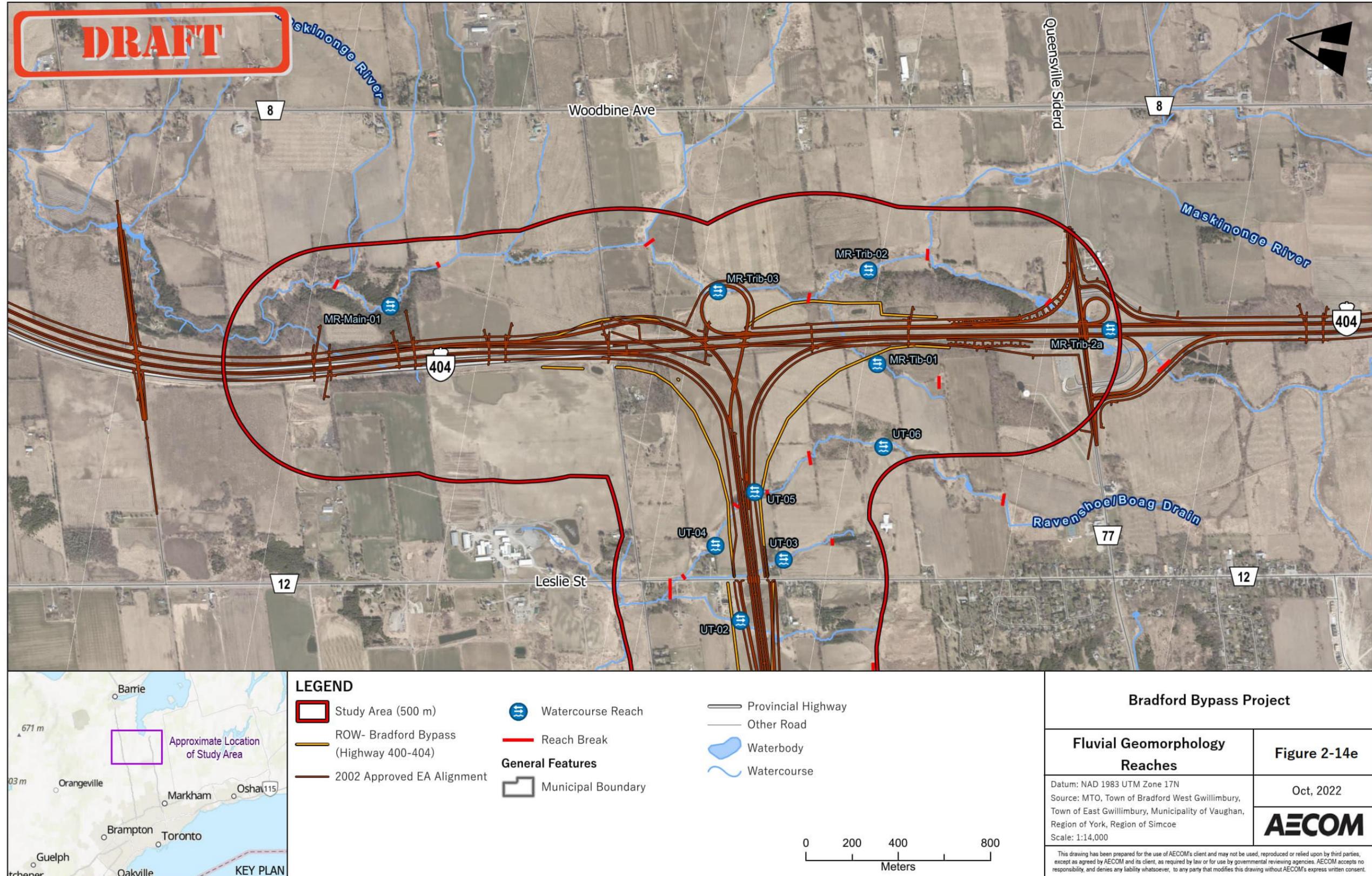


Figure 2-14e: Fluvial Geomorphology Reaches



Based on the assessed reaches for watercourses, the following are the results of the preliminary Rapid Geomorphic Assessment for each permanent watercourse (**Table 2-18**). Key findings for these permanent watercourses include:

- All reaches apart from HR-Trib-06 were characterized as “In Regime”
- The dominant processes occurring within the Fluvial Geomorphology Study Area include aggradation, widening, and planimetric form adjustment. Only three reaches (PC-Trib-03, HR-Trib-06, and HR-Trib-11) were characterized as having evidence of degradation
- For the major rivers, throughout the reach along HR-01 and HREB-01, there was minor evidence of aggradation, widening (for HR-01), and planimetric form adjustment.

Watercourses are dynamic features and therefore naturally undergo movement within a floodplain. The associated erosion and deposition that occurs as a result of meander development and migration processes can cause loss or damage to private property and/or infrastructure. For this reason, it is desirable to delineate a corridor that contains the natural meander and migration tendencies of the channel. Outside this corridor, it is assumed that private property and structures are beyond the area at risk from fluvial erosion. The space in which the meandering watercourse occupies on its floodplain, and in which all associated natural channel processes occur, is commonly referred to as the meander belt.

The Nottawasaga Valley Conservation Authority Planning and Regulation Guidelines (August 2009) and the Lake Simcoe Region Conservation Authority Watershed Development Guidelines (June 2020) set limitations for development within the Regulation Limit (meander belt) and provides protocols for defining appropriate meander belt widths for unconfined and confined systems. The Nottawasaga Valley Conservation Authority and Lake Simcoe Region Conservation Authority use the guidance publication Technical Guide – River and Stream Systems: Erosion Hazard Limit (Ontario Ministry of Natural Resources, 2002) for the development of their protocols. However, the Nottawasaga Valley Conservation Authority and Lake Simcoe Region Conservation Authority allow room for a qualified geomorphologist to predict the meander belt and erosion allowance using other accepted technical principles.

The predicted meander belt is determined on the basis of apparent (confined) and not apparent (unconfined) river and stream valleys. Confined watercourses come into contact with the valley wall on both sides of the channel which restricts channel migration. Thus, valley walls restrict the channel from occupying its potential meander belt, meanwhile Unconfined watercourses have no limits on spatial occupation of the floodplain (OMNR, 2002).

Table 2-18: Rapid Geomorphic Assessment Results

Reach	Crossing ID	Factor Value Aggradation	Factor Value Degradation	Factor Value Widening	Factor Value Planimetric Form Adjustment	Stability Index	Condition
PC-Trib-01	C10-A-3 C10-A-4	0.2	0	0	0.14	0.09	In Regime
PC-Trib-02	C10-A-1 C10-A-2	0.2	0	0.13	0.14	0.12	In Regime
PC-Trib-03	C10-A-C	0	0.29	0.13	0.14	0.14	In Regime
PC-Trib-04	C10-A-B	0	0	0	0.14	0.04	In Regime
HR-Trib-01	C10-C-2	0	0	0.25	0.14	0.1	In Regime
HR-Trib-03	C10-C-1	0	0	0.25	0.14	0.1	In Regime
HR-Trib-04	C11-A-1	0	0	0.25	0.14	0.1	In Regime
HR-Trib-06	C11-A-1	0.14	0.17	0.38	0.14	0.21	Transitional
HR-Trib-11	C16-A-1	0	0.17	0.38	0.14	0.17	In Regime
HR-Trib-12	C17-B-1	0.14	0	0.38	0.14	0.17	In Regime
UD-11	C18-F-1	0.14	0	0.13	0.14	0.1	In Regime
HREB-Trib-01	C22-A-1	0.14	0	0	0.14	0.07	In Regime
UT-06	C25-C-1	0.14	0	0.13	0.14	0.1	In Regime
MR-Trib-02a	C28-A-1	0.14	0	0	0.14	0.07	In Regime
MR-Trib-01	C25-A-2 C-26-A-1	0	0	0.38	0.14	0.13	In Regime
MR-Trib-02	C26-A-1	0.29	0	0	0.14	0.11	In Regime
MR-Trib-03	C26-A-1	0.29	0	0	0.14	0.11	In Regime
HR-01	C17-A-1	0.14	0	0.13	0.14	0.1	In Regime
HREB-01	C20-A-1 C20-B-1	0.14	0	0.00	0.14	0.07	In Regime

Meander belt widths were estimated for reaches that exhibit a defined channel and contain perennial or intermittent flows with downstream connectivity. Defined channels are preferred as they display the geomorphological characteristics required for the calculation of meander belts (i.e., bankfull, meander bends, bar forms, etc.). Such characteristics are not generally observed or displayed by ephemeral features. Cultivated reaches, ephemeral flows, and non-defined channels were not included in the use of meander belt width assessments (a measure of erosion risk) as they were not considered applicable in this case.

Meander belts are calculated to delineate and mitigate the erosion hazards associated with channel migration. As per the pertinent Conservation Authority's (Nottawasaga Valley Conservation Authority and Lake Simcoe Region Conservation Authority) guidelines, the meander belt size for confined and unconfined systems can vary if the watercourse is confined and within 15 metres of the confining valley slope. This is because when watercourses are close to the confining valley slope, they are limited in their lateral extent.

The meander belt for confined watercourses that are within 15 metres of the valley wall (PC-Trib-01, PC-Trib-02, PC-Trib-03) were calculated using the results for the empirical meander belt width plus the toe erosion allowance. For all remaining confined and unconfined systems, the final meander belt was calculated using the results for the empirical meander belt width plus the erosion rate. The preliminary meander belt results are presented in **Table 2-19**.

The meander belt width predicted for the Holland River (HR-01) is approximately 923.2 metres while the meander belt width predicted for the Holland River East Branch (HREB-01) is 987.3 metres (**Table 2-20**). These values were completed using an empirical approach and are considerably higher than the meander belts reported by Parish Geomorphic (2007) as outlined in the Holland River Subwatershed Management Plan and the Holland River East Subwatershed Plan. The information will be refined through design development for new culverts and bridges over these watercourses.

Although the Fluvial Geomorphology Study Area falls within the jurisdictions of the Nottawasaga Valley Conservation Authority and Lake Simcoe Region Conservation Authority, the 100 year erosion rates are based off the Toronto and Region Conservation Authority standard reference document for Crossing Guidelines for Valley and Stream Corridors (2015) and the Ministry of Natural Resources and Forestry's guidelines for Understanding Natural Hazards (2001). The Nottawasaga Valley Conservation Authority and Lake Simcoe Region Conservation Authority guidelines state that erosion hazards need to be considered for watercourse crossings, however do not specify how erosion rates should be calculated.

Table 2-19: Summary of Meander Belt Calculations for Permanent Watercourses

Reach	Crossing ID	Floodplain Characteristics	Within 15 metres of Confining Valley Wall?	Toronto And Region Conservation Authority Table 4 100-yr Erosion Rate (metre)	Toe Erosion Allowance (metre)	Empirical Preliminary Meander Belt Width (metre)	Final Meander Belt (metre)	Justification
PC-Trib-01	C10-A-3 C10-A-4	Partially Confined - right bank of feature is steep	Y	1	1	23.4	25.4	Preliminary Meander Belt + Toe Erosion Allowance
PC-Trib-02	C10-A-1 C10-A-2	Confined	Y	1-2	1 – 2	26.2	30.2	Preliminary Meander Belt + Toe Erosion Allowance
PC-Trib-03	C10-A-C	Confined	Y	8-15	8 – 15	26.2	42.2	Preliminary Meander Belt + Toe Erosion Allowance
PC-Trib-04	C10-A-B	Unconfined	N/A	8-15	N/A	15.6	31.6	Preliminary Meander Belt + Erosion Rate
HR-Trib-01	C10-C-2	Unconfined	N/A	5-8	N/A	25.9	39.5	Preliminary Meander Belt + Erosion Rate
HR-Trib-03	C10-C-1	Confined - upstream section	N	5-8	N/A	40.8	50.8	Preliminary Meander Belt + Erosion Rate
HR-Trib-04	C11-A-1	Unconfined	N/A	1	N/A	37.5	39.5	Preliminary Meander Belt + Erosion Rate
HR-Trib-06	C11-A-1	Unconfined	N/A	5-8	N/A	27.6	37.6	Preliminary Meander Belt + Erosion Rate
HR-Trib-11	C16-A-1	Confined	N	1-2	N/A	22.5	26.5	Preliminary Meander Belt + Erosion Rate
HR-Trib-12	C17-B-1	Unconfined	N/A	1	N/A	72	74	Preliminary Meander Belt + Erosion Rate
UD-11	C18-F-1	Unconfined	N/A	1-2	N/A	37.9	41.9	Preliminary Meander Belt + Erosion Rate
HREB-Trib-01	C22-A-1	Unconfined	N/A	1	N/A	35.3	37.3	Preliminary Meander Belt + Erosion Rate
UT-06	C25-C-1	Confined	N	1	N/A	22.1	24.1	Preliminary Meander Belt + Erosion Rate
MR-Trib-02a	C28-A-1	Unconfined	N/A	5-8	N/A	16.6	26.6	Preliminary Meander Belt + Erosion Rate
MR-Trib-01	C25-A-2 C26-A-1	Unconfined	N/A	5-8	N/A	22.5	32.5	Preliminary Meander Belt + Erosion Rate
MR-Trib-02	C26-A-1	Confined	N	1	N/A	29.3	31.3	Preliminary Meander Belt + Erosion Rate
MR-Trib-03	C26-A-1	Unconfined	N/A	1	N/A	20.6	22.6	Preliminary Meander Belt + Erosion Rate

Table 2-20: Summary of Meander Belt Calculations for the Holland River and Holland River East Branch

Reach	Crossing ID	Floodplain Characteristics	Average Channel Width (metre)*	100-year Erosion Rate (mapping) (metre)	Empirical Preliminary Meander Belt (metre)	Final Meander Belt Width (metre)	Justification
HR-01	C17-A-1	Unconfined	120	24.5 +/- 3	874.2	923.2	Preliminary Meander Belt + Erosion Rate
HREB-01	C20-A-1 C20-B-1	Unconfined	130	21.9 +/- 3	943.4	987.2	Preliminary Meander Belt + Erosion Rate

Based on the fluvial geomorphological and meander belt assessments, the following are noted:

- Forty-three features were investigated with twenty-six features identified as ephemeral and seventeen as permanent/intermittent features
- The majority of permanent/intermittent features investigated (seventeen in total) were found to be “In Regime” and with low erosion risk as per the field investigations and the results of the Rapid Geomorphic Assessment. Only one reach of a Holland River Tributary was found to be in “Transitional or Stressed” conditions and with “Moderate” erosion risk
- Meander belt for the seventeen permanent/intermittent features was completed using the preliminary meander data and the 100-year erosion rates
- An erosion risk is being developed to inform the crossing’s design and the erosion risks for all the watercourses investigated.

For the Holland River and Holland River East Branch, the following are noted:

- Given the low relief/flat topography in the vicinity of the Holland River and the Holland River East Branch, low rates of erosion are expected for the two watercourses. The watercourse is expected to remain stable given the result of the Rapid Geomorphic Assessment (In Regime), the field observations, and providing that the current conditions (land cover) of the watershed remain unaltered
- The 100-year erosion rates for the Holland River and the Holland River East Branch were calculated using the mapping approach. The approach used historical imagery from 1969, 1981, and 2018 to calculate the lateral migration of the watercourse. The erosional rates for the Holland River were calculated at 24.5 metres (+/- 3 metres) and at 21.9 metres (+/- 3 metres) for the Holland River East Branch
- The meander belt width assessment for the Holland River and the Holland River East Branch were completed using an empirical approach as it was deemed more reliable and accurate. The final meander belt with, including the 100-year erosion rates (calculated using the mapping approach), is 923.2 metres for the Holland River and 987.2 metres for the Holland River East Branch
- The placement of bridge piers is to be confirmed pending further development of the preliminary design. Opportunities to limit the need for bank protection measures along both Holland River Crossings where feasible, will be considered. It is recommended that alterations to the current planform of the watercourses be minimized or avoided as it can alter to the current quasi-equilibrium of the watercourses and affect the erosion rates.

Updates to these recommendations are expected to capture hydraulic modelling inputs as they are finalized through the Preliminary Design study.

2.2 Social and Economic Environment

Social and economic environment studies are being carried out to document and assess existing social and economic environment features, outline the preliminary description of potential impacts of the project on the social and economic environment, outline a description of potential measures to mitigate those impacts and identify applicable municipal, provincial, federal or other regulatory approvals or permits associated with the social and economic environment that may be required for the project.

Social and economic environment existing conditions information will be detailed in discipline specific existing condition and impact assessment reports to be completed during Preliminary Design. The sections below summarize the study methodologies and describe the existing environmental conditions for the following aspects of the social and economic environment:

- Land Use and Property
- Agriculture
- Noise and Vibration
- Air Quality
- Contamination, Waste and Excess Materials Management.

2.2.1 Land Use and Property

A land use and property study was undertaken to examine the existing land use, facilities, and future planned or approved development applications applicable to the project. The following sections outline the background, data collection and describe the existing environmental conditions within the Land Use and Property Study Area.

2.2.1.1 Background

The 2002 Approved Environmental Assessment included a detailed description of land use and property environmental conditions and commitments that were carried forward and considered in later stages project planning progresses.

As part of the preparatory work for the re-initiation of the Bradford Bypass in 2020, AECOM conducted a Land Use and Property Existing Conditions Report (AECOM,

2020), which provided a description of existing terrestrial ecosystems environmental conditions, summarized below:

- The Study Area consists of agriculture, general commercial, residential, and parks and open space land uses
- Regional Municipality of York and County of Simcoe identify the Bradford Bypass as a Planned Corridor and have policies to protect provincial corridors and right-of-way for transportation and transit facilities
- Bradford Bypass mainly traverses the lands within the Greenbelt Plan and Prime Agricultural land.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with land use and property. As such, an update to the description of the environmental conditions within the Land Use and Property Study Area is included in the following sections below.

2.2.1.2 Data Collection

The land use and property assessment included a review of the following planning policies and legislation:

- Provincial Planning Policies
 - Provincial Policy Statement (2014)
 - A Place to Grow: Growth Plan for the Greater Golden Horseshow (2019)
 - Greenbelt Plan (2017).
- Municipal Planning Policies
 - Simcoe County Official Plan (Office Consolidation 2016)
 - Regional Municipality of York Official Plan (2010, Office Consolidation 2019)
 - Town of East Gwillimbury Official Plan (2010, Office Consolidation 2018)
 - Town of King Official Plan (Draft 2017)
 - Town of Bradford West Gwillimbury Official Plan (2018)
 - Township of King Official Plan (2019)
 - County of Simcoe Transportation Master Plan (2014)
 - Town of Bradford West Gwillimbury Transportation Master Plan
 - Town of East Gwillimbury Transportation Master Plan (2010)
 - King Township Transportation Master Plan (2020).

Refer to **Section 1.5.3** for details on each policy and applicability to the project.

The existing land uses were identified using a desktop review utilizing Google Earth, and were also confirmed during the field visit completed between September 2021 and June 2022. Staff from each of the impacted municipalities were contacted in January 2021 and in April and May 2022 to review any applications and development activity within 500 metres of the Bradford Bypass corridor.

2.2.1.3 Description of Environmental Conditions

2.2.1.3.1 Existing Land Uses

Land use within the Bradford Bypass corridor itself have been protected since 1993 when the 2002 Approved Environmental Assessment was started. For that reason, there has been little change in land use since that time within the Land Use and Property Study Area. The existing land uses within the Land Use and Property Study Area are predominantly characterized by agricultural lands, green spaces and vacant vegetated lands, as well as residential and commercial/industrial areas, as shown on **Figure 2-15**.

Additionally, there are a number of Special Policy Areas within the Land Use and Property Study Area, which are summarized in **Table 2-21** and shown on **Figure 2-15**.

Figure 2-15: Existing Land Uses Within the Land Use and Property Study Area

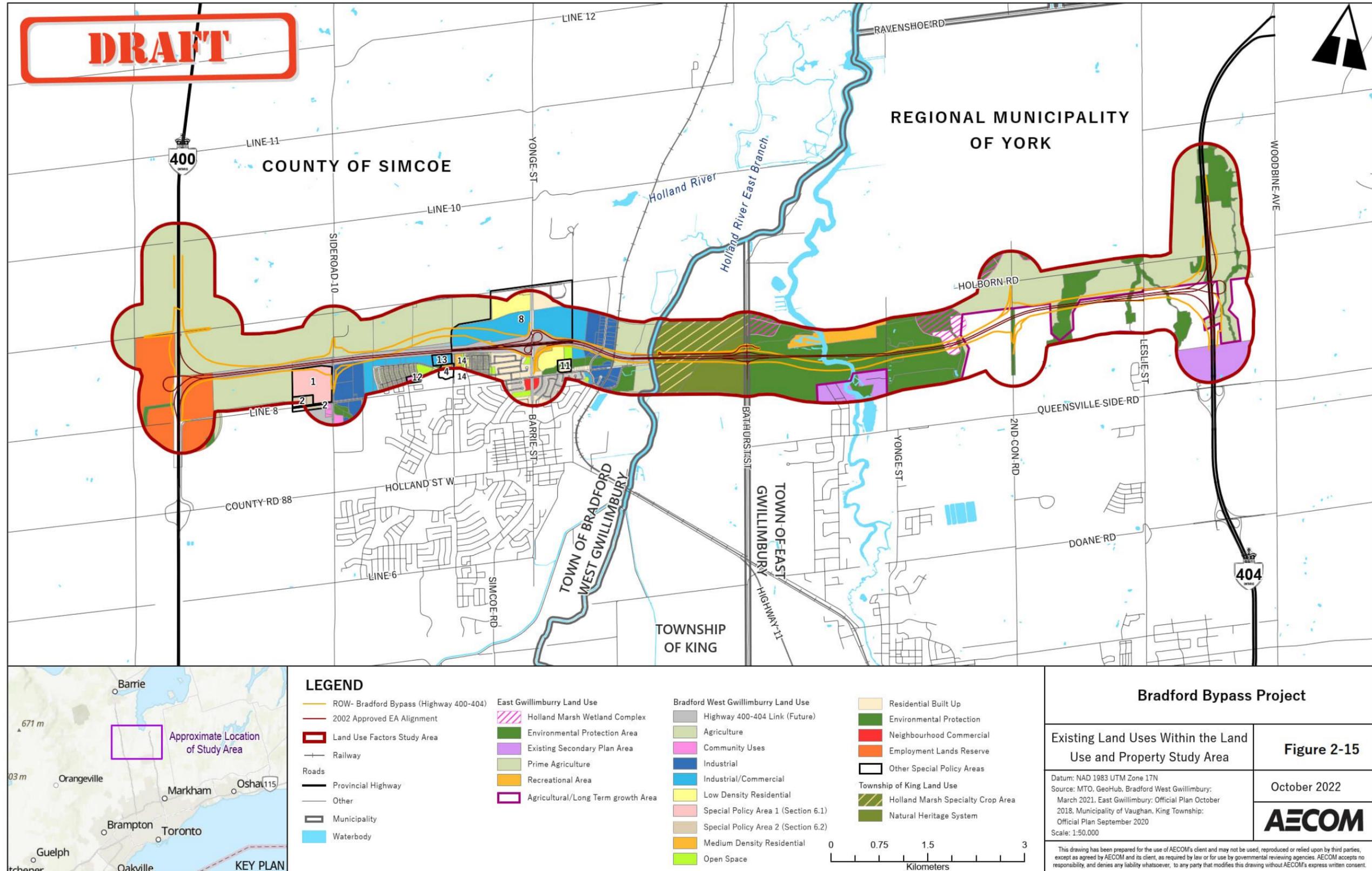


Table 2-21: Special Policy Areas Within the Land Use and Property Study Area

Special Policy Area	Description
Special Policy Area 1 – Line 8	<ul style="list-style-type: none"> Development within these lands identified as Special Policy Area 1 shall be by plan of subdivision or condominium in an industrial park setting. Additional policies in regard to size, access, servicing arrangement, buffering and visual screening, noise and vibration study, etc.¹ are applicable to development in these lands.
Special Policy Area 2 – Line 8	<ul style="list-style-type: none"> On lands identified within Special Policy Area 2, only legal existing uses and uses permitted in the Agricultural designation are permitted. Any new land use shall require an amendment to the Official Plan for the entirety of Special Policy Area 2.
Special Policy Area 4 – Townhouse Blocks North of Line 8	<ul style="list-style-type: none"> Both Low-Density Residential and Medium-Density Residential Designations are permitted within lands identified as Special Policy 4. Permitted uses shall include single detached, semi-detached, duplex, triplexes, fourplexes, street fronting townhouses, cluster townhouses and low rise apartments.
Special Policy Area 8 – Lands North of the Highway 400-404 Link in Bradford	<ul style="list-style-type: none"> Portions of the Land Use and Property Study Area north of the Bradford Bypass corridor in the Bradford Urban Area overlays the lands identified within Special Policy Area 8. These lands have been identified for future urban development since the adoption of the amalgamated Bradford West Gwillimbury’s first Official Plan, with land use designations applied. The lands are currently occupied by rural and estate residential uses, agriculture, and limited employment lands development along Artesian Industrial Parkway. A Secondary Plan shall be first in effect before significant development is permitted in these lands.
Special Policy Area 11 – Residential Apartments	<ul style="list-style-type: none"> Lands identified within Special Policy Area 11 are located on the north side of the 8th Line, east of Colborne Street, and more specifically described as 2362 8th Line, in the Town of Bradford West Gwillimbury. The Policy Area allows for a high density “adult lifestyle” development comprised of residential apartments with a compact form of development that represents an efficient use of the land.
Special Policy Area 12 – School Board Lands²	<ul style="list-style-type: none"> An elementary school site for the Separate School Board is identified as Special Policy Area 12 on Schedule B-1 of this Plan. The location of this elementary school site has been determined in consultation with the School Board and the Town of Bradford West Gwillimbury.
Special Policy Area 13¹	<ul style="list-style-type: none"> Special Policy Area 13, directly adjacent to the corridor in the central part of Bradford permits a variety of employment, commercial and institutional uses. The site has recently been approved for a secondary school.
Special Policy Area 14 – Parking and Infrastructure¹	<ul style="list-style-type: none"> In addition to the uses permitted in the Open Space designation, municipal or private parking and municipal or private infrastructure shall also be permitted on lands identified as Special Policy Area 14.

1. Refer to policies noted in Section 6.1 King Official Plan 2018.

2. Special Policy Area has been added since the completion of the Land Use Factors Existing Conditions Report (AECOM, 2020).

A number of businesses, industrial units, institutional, community and recreational services are currently operating within the Land Use and Property Study Area. The existing services and facilities within the Land Use and Property Study Area are listed in **Table 2-22**.

Table 2-22: Existing Services and Facilities Within the Land Use and Property Study Area

Service/Facility	Address
Bradford Barn, Event Venue	3287 9 th Line, Bradford West Gwillimbury
Dortec Bradford	3066 8 th Line, Bradford West Gwillimbury
The Sarjeant Co. Ltd.	3111 10 th Sideroad, Bradford West Gwillimbury
Hydrosphere – The Koi Pond Experts	3301 10 th Sideroad, Bradford West Gwillimbury
Bradford Sports Dome	2971 10 th Sideroad, Bradford West Gwillimbury
Bob Fallis Sports Centre	2961 10 th Sideroad, Bradford West Gwillimbury
Spectra Aluminium Products	95 Reagens Industrial Parkway, Bradford West Gwillimbury
Canada Logix and Supply Chain Inc.	39 Selby Crescent, Bradford West Gwillimbury
Creamfields by Rosehaven Homes	133 McCann Crescent, Bradford West Gwillimbury
Toptintz	McCann Crescent, Bradford West Gwillimbury
Aqua Academy Swim School	3053 9 th Line, Bradford West Gwillimbury
Wizard Custom Paint	2925 9 th Line, Bradford West Gwillimbury
Arise Coaching Centre Inc.	87 Chelsea Crescent, Bradford West Gwillimbury
Realis No Frills	305 Barrie Street, Bradford
Bradford Day Care	57 Highland Terrace, Bradford West Gwillimbury
Wimpy's Diner	305 Barrie Street, Bradford West Gwillimbury
GFL Bradford Liquid Waste Infrastructure Hydrovac Division	3001 Simcoe County Road 4, Bradford West Gwillimbury
Onefive Cancel Store	2546 9 th Line, Bradford West Gwillimbury
Bradford Community Church	2465 9 th Line, Bradford West Gwillimbury
Lisbon Paving Co Limited	280 Artesian Industrial Parkway, Bradford West Gwillimbury
Titan Concrete	215 Artesian Industrial Parkway, Bradford West Gwillimbury
John Eek and Son Ltd.	190 Artesian Industrial Parkway, Bradford West Gwillimbury
AGC Automotive Canada Inc.	120 Artesian Industrial Parkway, Bradford West Gwillimbury
Fix Auto Bradford	70 Artesian Industrial Parkway, Bradford West Gwillimbury
Vins Plastics	12 Industrial Court, Bradford West Gwillimbury
Petro-pass Truck Shop	436 Dissette Street, Bradford
ATV Farms	21360 Bathurst Street, Holland Landing

Service/Facility	Address
Holland River Marina	21259 Bathurst Street, Holland Landing
Albert's Marina	21019 Bathurst Street North, River Drive Park
Silver Lake Golf & Country Club	2114 Yonge Street, East Gwillimbury
Crystal Star Nursey	20815 2 nd Concession Road, East Gwillimbury
Holburne Mushroom Farm	1337 Holborn Road, East Gwillimbury
Queensville Sod Farms	21468 Leslie Street, Queensville
Queensville Park and Ride	Queensville Side Road, East Gwillimbury

2.2.1.3.2 Future Planned or Approved Developments

While the development within the corridor has been restricted for 20 years, development adjacent to the corridor in the Bradford Urban Area, is occurring rapidly. Staff from each of the impacted municipalities were contacted in January 2021 and April and May 2022 to review any applications and development activity generally within 500 metres of the Bradford Bypass corridor.

The project mainly crosses the lands zoned and designated agricultural or environmental protection within the Town of East Gwillimbury and are also within the Greenbelt Protected Countryside or Natural Heritage System. With these designations little or no development can occur.

Similar to the Town of East Gwillimbury, the Bradford Bypass corridor crosses the lands zoned and designated Agricultural or Environmental Protection within King Township and are within the Greenbelt Protected Countryside or Natural Heritage System. With these designations little or no development can occur and hence, there is no application activity.

In Bradford West Gwillimbury, virtually all of the lands south of the corridor are designated for urban development and there are considerable activities occurring within 500 metres of the corridor. The majority of development activities currently occurring in a number of areas in Bradford West Gwillimbury include requests to consider land use conversions from Employment Lands to Residential Lands. Under the policies and legislation in Ontario, this can only be done at the time of a Municipal Comprehensive Review.

Simcoe County is in the process of a Municipal Comprehensive Review, and once complete the County will allocate growth to the lower tier municipalities. Those municipalities will then have to update their official plans, and at that time can consider urban boundary adjustments and land use conversions. The Town of Bradford West Gwillimbury has already had numerous requests to convert Employment Lands to Residential in the forthcoming Municipal Comprehensive Review.

Future planned and approved developments within the Land Use and Property Study Area are listed in **Table 2-23**, and are shown on **Figure 2-16**.

Table 2-23: Active Development Applications Within the Land Use and Property Study Area

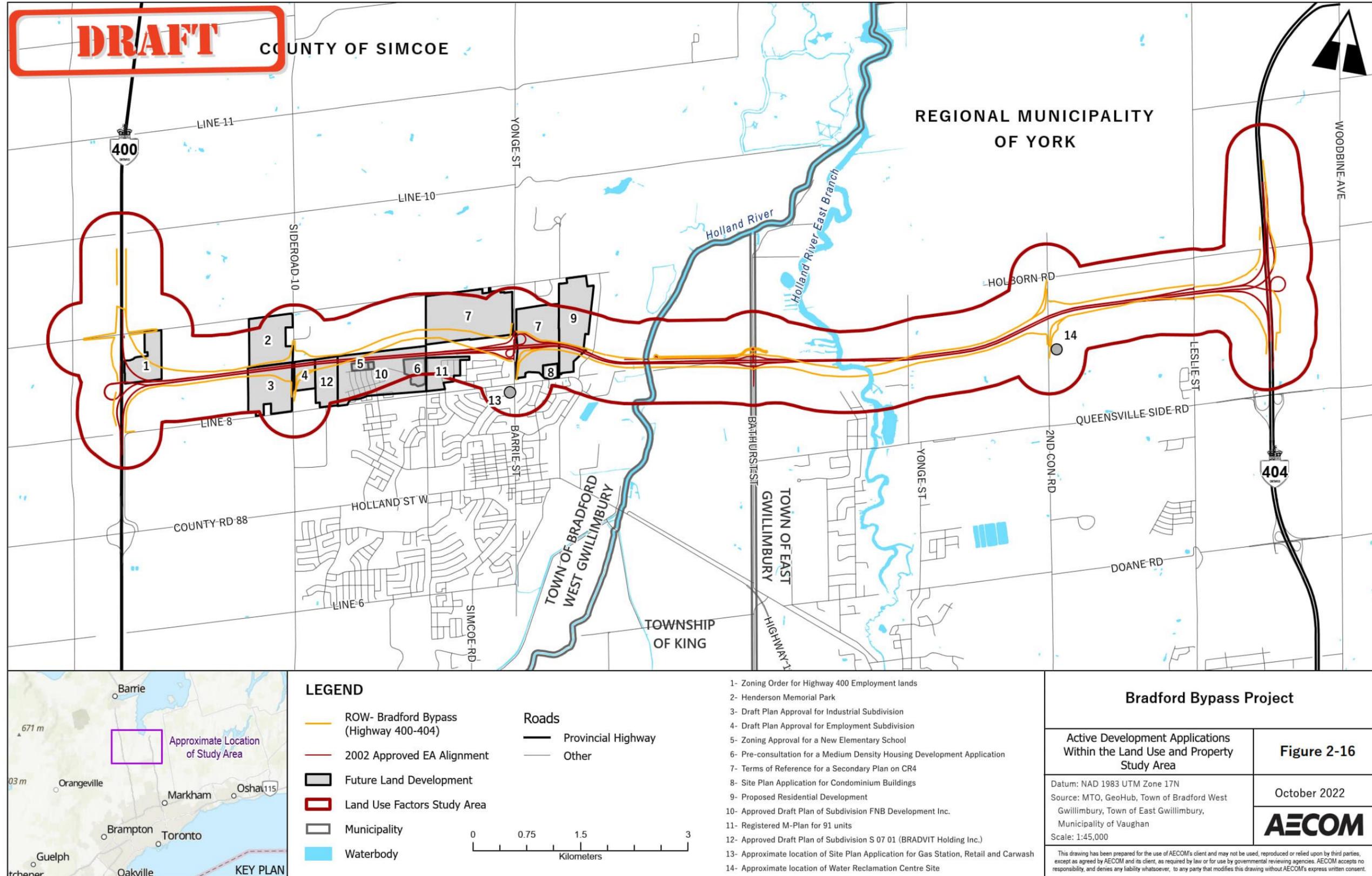
Map ID	Application	Jurisdiction	Description
1	Zoning Order for Highway 400 Employment Lands	Town of Bradford West Gwillimbury	■ The lands adjacent to Highway 400 were the subject of a Minister's Zoning Order to permit industrial uses. The lands are now designated and zoned for industrial purposes; however, development of the land relies on municipal services that are not yet available to the lands (Municipal Planning Consultants, May 2022).
2	Henderson Memorial Park	Town of Bradford West Gwillimbury	■ Henderson Memorial Park is a municipal park located at 3171 9 th Line, providing a number of baseball and soccer playing fields. The Town is in the process of developing a multi-use plan for this park (Municipal Planning Consultants, May 2022).
3	Draft Plan Approval for Industrial Subdivision	Town of Bradford West Gwillimbury	■ A draft plan was approved for an industrial subdivision at 3100 10 th Sideroad; however, that approval has lapsed. The plan had a 4-hectare block on the north side dedicated for the Bradford Bypass corridor. The landowners have recently discussed undertaking an Official Plan and Zoning By-law amendment to convert the lands from Employment to Residential (Municipal Planning Consultants, May 2022).
4	Draft Plan Approval for Employment Subdivision	Town of Bradford West Gwillimbury	■ The Sarjeant Concrete property has a draft plan approval for a subdivision located at 3111 10 th Sideroad for employment uses. A block has been reserved for the Bradford Bypass corridor on the north side of the lands. These lands could be impacted by a new interchange in that location. Access to the site is limited to an extension of Crossland Blvd. to the east (Municipal Planning Consultants, May 2022).
5	Zoning Approval for a New Elementary School	Town of Bradford West Gwillimbury	■ A Site Plan Application has been submitted to the Town of Bradford West Gwillimbury for a new elementary school at 400 Crossland Boulevard; currently under technical review. The Simcoe County District School board has obtained zoning approval for a secondary school on this site (Municipal Planning Consultants, May 2022).
6	Pre-consultation for a Medium Density Housing Development Application	Town of Bradford West Gwillimbury	■ Pre-consultation has been completed with the Town of Bradford West Gwillimbury to establish the requirements for an application for a medium density housing development North of 8 th Line, west of Professor Day Drive. The Town of Bradford's staff noted that the applications have not yet been filed (Municipal Planning Consultants, May 2022).
7	Terms of Reference for a Secondary Plan on County Road 4	Town of Bradford West Gwillimbury	■ The property owners are working with the Town of Bradford West Gwillimbury for the development of a Terms of Reference for the Secondary Plan at the property located west of County Road 4. This property is subject to policies that require that a Secondary Plan be approved before major development can proceed within the area (Municipal Planning Consultants, May 2022).
8	Site Plan Application for Condominium Buildings	Town of Bradford West Gwillimbury	■ The property located at 2362 8 th Line is the subject of an application to permit a two-building adult lifestyle development. A Site Plan Application for condominium buildings, 218 units, in 6 stories and 3 levels of underground parking has been submitted and is currently under technical review (Municipal Planning Consultants, May 2022).
9	Proposed Residential Development at 8 th Line and Artesian Industrial Parkway	Town of Bradford West Gwillimbury	■ Pre-consultation with the Town of Bradford West Gwillimbury has been undertaken for a residential development proposal at the location of 8 th Line and Artesian Industrial Parkway. However, no application has been filed at this time (Municipal Planning Consultants, May 2022).
10	Approved Draft Plan of Subdivision FNB Development Inc.	Town of Bradford West Gwillimbury	■ A draft plan of subdivision located at part of the south half of Lot 12, and part of Lot 13, Concession 8, Town of Bradford West Gwillimbury Between Crossland Blvd. and Bradford Bypass Corridor. The application includes 17 Industrial/Commercial lots, one (1) 400-404 Alignment Block, one (1) Municipal Stormwater Management block, four (4) 0.3 metre reserves, one (1) municipal road widening block for 8 th Line and roads noted as Streets A and Street b (Crossland Boulevard) (Town of Bradford West Gwillimbury, February 2021 ³).
11	Registered M-Plan	Town of Bradford West Gwillimbury	■ According to communication with Simcoe County (January 2021), the Registered M-Plan for 91 units located North of Gardiner Drive has been identified within the Land Use and Property Study Area:

3. Project Team's email correspondence with the Town of Bradford West Gwillimbury 's staff dated February 2021.

Map ID	Application	Jurisdiction	Description
12	Approved Draft Plan of Subdivision S 07 01 (BRADVIT Holding Inc.)	Town of Bradford West Gwillimbury	■ An approved draft plan of subdivision located at part of Lot 11, Concession 8, Town of Bradford West Gwillimbury Between 8th Line and Bradford Bypass Corridor includes 377 units of detached dwellings, 171 units of townhouse dwellings, and 97 units of medium density residential units. Among others, it also includes one (1) stormwater management block, one (1) elementary school block, one (1) block for employment, two (2) blocks for road widening, two (2) blocks for future developments (Town of Bradford West Gwillimbury, February 20214).
13	Site Plan Application for Gas Station, Retail and Carwash	Town of Bradford West Gwillimbury	■ A Site Plan Application for a gas station, retail use and car wash at 300 Barrie Street is currently under technical review by the Town of Bradford West Gwillimbury (Town of Bradford West Gwillimbury Website, May 2022).
14	The Water Reclamation Centre Site	Town of East Gwillimbury	■ York Region is completing the Water Reclamation Centre Project is part of Upper York Sewage Solutions which contains leading-edge treatment technology for treatment of wastewater from the Town of East Gwillimbury and a portion from the Town of Newmarket and Aurora. It will be located between 20841 and 20967 2 nd Concession in the Town of East Gwillimbury. The Upper York Sewage Solutions project will provide needed wastewater servicing, while providing future options to recycle treated wastewater through reclaimed water applications. York Region is waiting for the Ministry of the Environment, Conservation and Parks' final approval of the associated Environmental Assessment to proceed with the Water Reclamation Centre and other parts of the project (York Region, 2022).

4. Project Team's email correspondence with the Town of Bradford West Gwillimbury 's staff dated February 2021.

Figure 2-16: Active Development Applications Within the Land Use and Property Study Area



2.2.2 Agriculture

The agriculture assessment examines the existing agricultural land capability, agricultural land use, agricultural investments, and land fragmentation within the Agriculture Study Area. The following sections outline the background, data collection and describe the existing environmental conditions within the Agriculture Study Area.

2.2.2.1 Background

The 2002 Approved Environmental Assessment included a high-level agricultural assessment, description of agricultural existing conditions within the Study Area, and made recommendations for mitigation should agricultural resources be impacted during further design or construction.

The Preliminary Design preparatory work Land Use Factors Existing Conditions Report completed in February 2020 (AECOM, 2020, under separate cover) provided a description of land use environmental conditions within the Study Area, which was reviewed as part of the agricultural existing conditions assessment. Refer to **Section 2.2.1** for updated land use existing conditions within the Land Use and Property Study Area.

2.2.2.2 Data Collection

An agricultural assessment for the project was completed in accordance with the Regulation. A variety of data sources, land use Official Plans and policies, zoning by-laws and other guidelines were reviewed to characterize the extent of agriculture resources and to assess any potential existing (or future) impacts to agriculture within the Agriculture Study Area that may occur as a result of the proposed future development of the project.

It was noted that none of the Official Plans contained specific information on how to complete an Agricultural Impact Assessment. As a result, a further review was completed to determine the existence and use of Agricultural Impact Assessment Guidelines in Ontario. The review determined that the Region of Halton has created a document titled “Agricultural Impact Assessment Guidelines (2014)” which included specific standards and guidelines for completing Agricultural Impact Assessment within the boundaries of the Region of Halton. Therefore, the guidelines that informed the agricultural assessment for this project included the Region of Halton Agricultural Impact Assessment Guidelines (2014), discussions with staff from the Ontario Ministry of Agriculture, Food and Rural Affairs, and the Ontario Ministry of Agriculture, Food and Rural Affairs’ Draft Agricultural Impact Assessment Guidance Document (2018).

Other data sources that were reviewed and evaluated were:

- The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources (1984)
- Land Information Ontario digital physiographic region data
- Agronomy Guide for Field Crops (Ontario Ministry of Agriculture, Food and Rural Affairs 2009)
- Agricultural Resource Inventory and Ontario Ministry of Agriculture, Food and Rural Affairs Agricultural System Portal
- Land fragmentation data from the Agricultural System Portal (Ontario Ministry of Agriculture, Food and Rural Affairs), the Township of King, the Town of East Gwillimbury, the Town of Bradford West Gwillimbury, the Region of York and the County of Simcoe websites
- Soil survey data and Canada Land Inventory data (Ontario Ministry of Agriculture, Food and Rural Affairs)
- Agricultural statistics from Ontario Ministry of Agriculture, Food and Rural Affairs website for Southern Ontario, York Region, Simcoe County, the Greater Golden Horseshoe, and the Greater Toronto Area
- Online digital imagery (Google Earth Pro, Bing Mapping, Birds Eye Imagery), and the Region of York, and County of Simcoe online imagery.

For the purposes of the agricultural assessment, Geographic Information Systems mapping was used to calculate the percentages of agricultural lands within the Bradford Bypass right-of-way and the Agriculture Study Area.

2.2.2.3 Description of Environmental Conditions

A review of the boundaries of the Growth Plan for the Greater Golden Horseshoe (2019) area determined that much of the Agriculture Study Area lands comprise Prime Agricultural Areas. Smaller areas of Specialty Crop lands were identified adjacent to the Holland River and Holland River East Branch areas. Further, small areas of Candidate Prime Agricultural Areas were noted between the rail line and the Specialty Crop Areas east of the Holland River.

The Agriculture Study Area comprise a mix of land uses including urban uses, rural uses, agricultural lands, transportation corridors, and woodlots. A portion of the Agriculture Study Area rests within the built boundary of the Town of Bradford West Gwillimbury.

The agricultural lands and resources within the Agriculture Study Area are shown in **Figure 2-17**.

2.2.2.3.1 Agricultural Land Capability

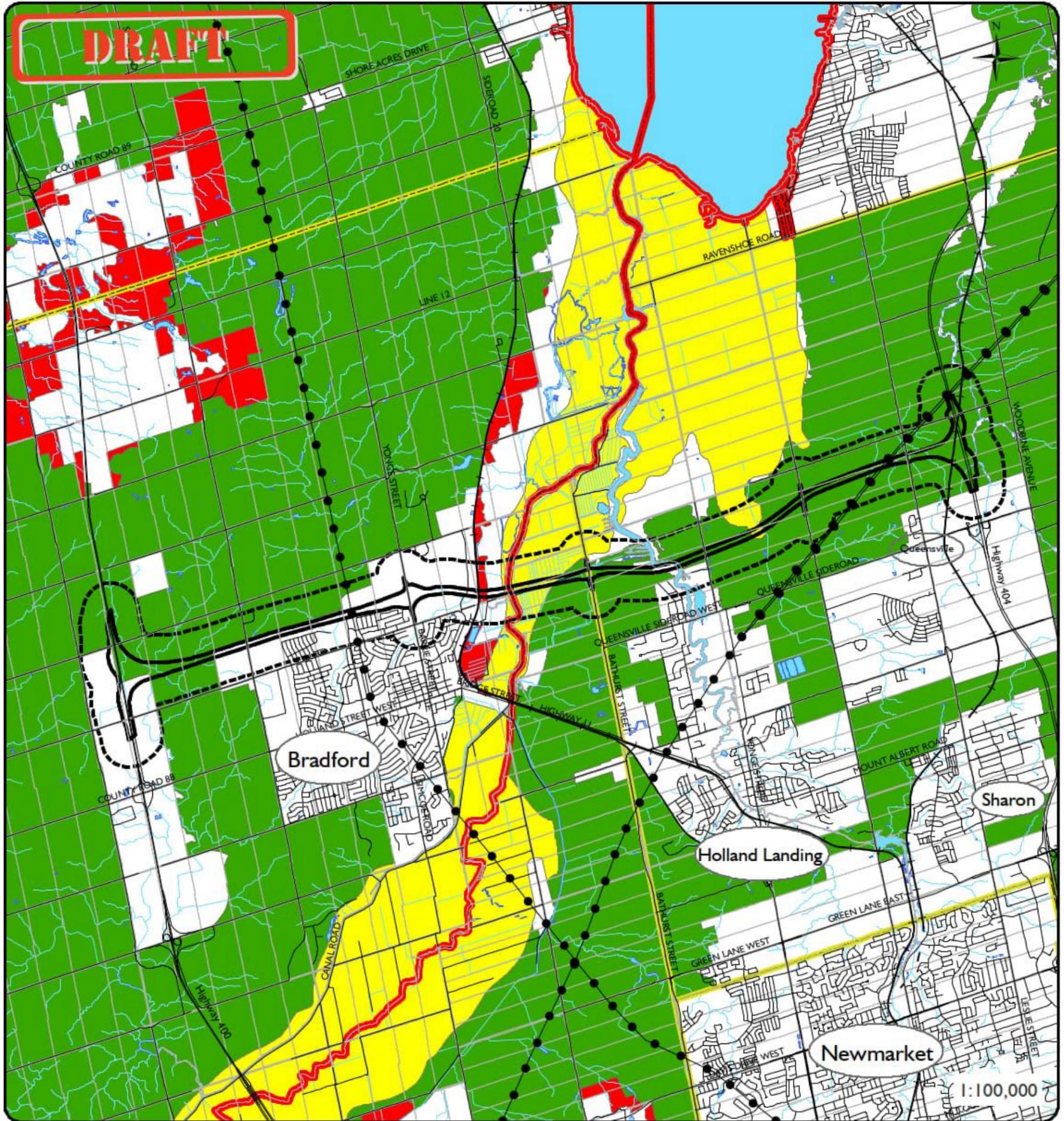
There are seven classes used to rate agricultural land capability. Class 1 lands have the highest and Class 7 lands the lowest capability to support agricultural land use activities.

The lands within the Bradford Bypass right-of-way are comprised of approximately 74.1 percent Canada Land Inventory capability of Class 1 – 3, with approximately 52.2 percent as Class 1, 7.3 percent as Class 2, and 14.6 percent as Class 3. Approximately 18.0 percent of the lands within the Bradford Bypass right-of-way is comprised of Class 4 lands, with approximately 3.0 percent as Class 5. The remaining 4.9 percent of the lands were not rated and included organic soils, built up areas, roads and rail lines.

The Agriculture Study Area comprised approximately 66.8 percent Canada Land Inventory capability of Class 1 – 3, with 39.1 percent as Class 1, 14.3 percent as Class 2, and 13.5 percent as Class 3. Approximately 17.0 percent of the Agriculture Area is Class 4 lands, with approximately 3.3 percent as Class 5, and the remaining 12.8 percent as Not Rated including organic soils, built up areas, roads and rail lines.

The Geographic Information Systems calculated area of the Study Area is approximately 314.1 hectare. The future development of the project will result in the loss of approximately 164.0 hectare of Class 1 lands, 22.9 hectare of Class 2 lands, 45.8 hectare of Class 3 lands, 56.6 hectare of Class 4 lands, 9.5 hectare of Class 5 lands, 14.0 hectare of organic soils, and 1.3 hectare of urban lands, as based on the Ontario Ministry of Agriculture, Food and Rural Affairs soils data.

Figure 2-17: Agricultural Resources Within the Agriculture Study Area



Legend

Railway (MNRF)	Agriculture Study Area
Roads (MNRF)	Water Body (MNRF)
Utility Line (MNRF)	Upper Tier Boundary (MNRF)
Water Course (MNRF)	Identification
Lot Lines (MNRF)	Candidate Area
Lower Tier Boundary (MNRF)	Prime Agricultural Area
Secondary Study Area (500 m)	Specialty Crop Area

Bradford Bypass Project

Agricultural Resources Within
the Agriculture Study Area

DBH Soil Services Inc.
December 2021

Figure 2-17

2.2.2.3.2 Agricultural Land Use

The Agriculture Study Area comprised land use of approximately 15.0 percent as built up/disturbed areas, 29.5 percent as common field crop (soybean, corn), 2.1 percent as cover crop, 4.5 percent as forage/pasture lands, 0.8 percent as harvested lands, 8.7 percent as market garden crops, 4.3 percent as open field, 0.1 percent as planted lands, 1.4 percent as plowed lands, 2.0 percent as recreation lands (golf course), 6.8 percent as scrublands, 0.9 percent as small grains, 2.3 percent as sod, 2.5 percent as unknown, and 19.1 percent as woodland areas. The lands within the Bradford Bypass right-of-way comprised land use of approximately 2.3 percent as built up/disturbed areas, 36.9 percent as common field crop (soybean, corn), 1.6 percent as cover crop, 3.7 percent as forage/pasture lands, 0.8 percent as harvested lands, 6.4 percent as market garden crops, 11.8 percent as open field, 3.6 percent as plowed lands, 3.7 percent as scrublands, 3.3 percent as sod, 5.2 percent as unknown, and 20.6 percent as woodland areas. The predominant land uses in the lands within the Bradford Bypass right-of-way include the production of common field crops, woodland areas, and open field areas.

2.2.2.3.3 Agricultural Investment

Forty-seven agricultural facilities were identified within the Agriculture Study Area. Of those, only 1 agricultural facility was observed in the lands within the Bradford Bypass right-of-way, with the remaining 46 agricultural facilities observed outside the right-of-way. A review of the online Agricultural System Portal (Ontario Ministry of Agriculture, Food, and Rural Affairs, 2022) indicated that there were no nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the Agriculture Study Area. The Agricultural System Portal did indicate the presence of vegetable fields, which were also noted in the land use survey.

2.2.2.3.4 Land Fragmentation

Land fragmentation represents a major impact to the long-term viability of agriculture in the Agriculture Study Area and is typical of areas under pressure from non-agricultural land uses. The Agriculture Study Area comprises numerous parcels of varying size. The parcel count for the Agriculture Study Area indicates the presence of numerous small parcels, and fewer larger parcels. This type of fragmentation pattern is common in areas near urban boundaries and within the Greater Toronto Area. It is noted that portions of the Agriculture Study Area include urban areas of the Town of Bradford West Gwillimbury and north of Holland Landing.

Given the geographical location of these lands, the Agricultural Impact Assessment concluded that the future development of the Bradford Bypass lands would have minimal impact on the surrounding agricultural activities within the Agriculture Study Area lands, and lands can reasonably be developed for the Bradford Bypass.

2.2.3 Noise and Vibration

The noise and vibration existing conditions assessment identifies Noise Sensitive Areas and establishes preliminary existing noise conditions within the Noise and Vibration Study Area. The following sections outline the background, data collection and describe the existing environmental conditions within the Noise and Vibration Study Area.

Vibration studies are not required at this Preliminary Design stage. The Project Team continues to receive input from property owners and key stakeholders, and will consider features that may fall within the zone of influence for vibration, within the Noise and Vibration Study Area. These features include lands adjacent to areas of construction, including buildings and structures that potentially may be impacted by vibrations emanating from construction activities. Where locations are identified with respect to potential vibration concerns, these locations, and concerns will be documented along with proposed mitigation measures in the Environmental Impact Assessment Report, and carried forward as recommendations or commitments to the next phase of design and construction. Locations and associated mitigation measures may be added, removed or modified as the design advances.

2.2.3.1 Background

The 2002 Approved Environmental Assessment included a high level assessment of highway and construction, which identified noise sensitive areas and receiver locations, and made recommendations for increased noise levels as a result of the project. A description of the existing noise and vibration conditions within the Noise and Vibration Study Area is included in the following sections below.

The Preliminary Design preparatory work Land Use Factors Existing Conditions Report completed in February 2020 (AECOM, 2020) provided a description of land use environmental conditions within the Study Area, which was reviewed as part of the noise and vibration existing conditions assessment. Refer to **Section 2.2.1** for updated land use existing conditions within the Land Use and Property Study Area.

2.2.3.2 Data Collection

The evaluation of the existing noise conditions for the project will be conducted in accordance with the Ministry's Environmental Guide for Noise published in 2022.

Sections relevant for this document include the area of investigation, the definition of Noise Sensitive Areas, and future no-build noise levels (existing conditions).

As per the Ministry's Environmental Guide for Noise, where a corridor or route is located through or adjacent to existing Noise Sensitive Areas, the area of investigation must be determined using one of the following methods:

- Using 5 decibel contour lines extending from the source to the Noise Sensitive Area where there is no increase above the future no-build sound level
- A Noise Sensitive Area where there is no increase above the future no-build sound level
- A perpendicular distance of 600 metres from the closest edge of pavement and 100 metres from the ends of the pavement.

Noise levels are predicted in the Outdoor Living Areas associated with Noise Sensitive Areas. An Outdoor Living Area, as defined in the Ministry's Environmental Guide for Noise, is an area at ground level, adjacent to a Noise Sensitive Area, intended and designed for the enjoyment of the outdoor environment, and readily accessible from the building. An Outdoor Living Area is typically situated in the backyard for a dwelling unit but may be situated on any side of the Noise Sensitive Area. Other examples include outdoor swimming pool/tennis courts for hotels/motels.

Noise Sensitive Areas are defined in two different classifications according to the Ministry's Environmental Guide for Noise, Traditional Noise Sensitive Areas and Special Land Use Noise Sensitive Areas. Note that all Noise Sensitive Areas must have an associated Outdoor Living Areas. Traditional Noise Sensitive Areas include the following land uses, with an Outdoor Living Area associated with them:

- Private homes such as single-family residences
- Townhouses
- Multiple unit buildings, such as apartments with Outdoor Living Areas for use by occupants
- Hospitals, nursing homes for the aged, where there are Outdoor Living Areas for the patients.

Special Land Use Noise Sensitive Areas are only considered noise sensitive under certain conditions. A key concept for the consideration of Special Land Use Noise Sensitive Areas according to the Ministry's Environmental Guide for Noise is that they are "part of a community", meaning the Special Land Use Noise Sensitive Area is located next to a Traditional Noise Sensitive Area. Additionally, mitigation measures for

Special Land Use areas are considered on a case-by-case basis and only if the adjacent Traditional Noise Sensitive Area already has technically, economically and administratively feasible noise mitigation.

Where a new freeway / highway corridor or route is planned, the following Special Land Use areas would qualify as Noise Sensitive Areas in addition to Traditional Noise Sensitive Areas:

- Educational facilities and day care centres, where there are Outdoor Living Areas for students
- Campgrounds that provide overnight accommodation
- Hotels / motels where there are Outdoor Living Areas for visitors
- Community centres with Outdoor Living Areas
- Municipal parks only “as part of a community” (excluding golf courses and trails)
- Places of worship with Outdoor Living Areas only “as part of a community”.

The following land uses do not qualify as Noise Sensitive Areas:

- Apartment balconies above ground floor
- Cemeteries
- All commercial
- All industrial.

The baseline existing conditions are defined by the Ministry’s Environmental Guide for Noise as the ‘future no build’ scenario. The “future no build” noise levels are to be predicted, using an approved noise model, where an existing freeway/highway/roadway is the main source of noise. Where there is no dominant noise source, “future no build” noise levels can be assumed based upon the area classification, as defined in the Ministry of Environment, Conservation and Parks’ guideline NPC300. The assumed noise level must be confirmed by the Ministry of Transportation and Ministry of the Environment, Conservation and Parks. The assumable noise levels by area classification are:

- Class 1 Area (urban) – 50 dBA
- Class 2 Area (suburban) – 45 dBA
- Class 3 Area (rural) – 40 dBA
- Class 4 Area – 55 dBA

2.2.3.3 Description of Environmental Conditions

Existing Noise Sensitive Areas within the Noise and Vibration Study Area were identified using aerial imagery, and are summarized in **Table 2-24** and shown on **Figure 2-18**. As noted in **Table 2-24**, six potential future noise sensitive land use developments have been identified within the Noise and Vibration Study Area. However, all Noise Sensitive Areas and subsequent points of reception for analysis will be refined to reflect the updated Technically Preferred Route as the design is advanced.

Traffic noise predictions for the “future no build” existing conditions will be completed during the impact assessment stage of the project since there is insufficient information available for a comprehensive analysis. Therefore, at this time, the background noise levels for the existing environmental conditions will be assumed as per the Ministry of Transportation Environmental Guide for Noise.

At this stage of the project, it is premature to conduct traffic noise predictions to predict the “future no build” existing condition noise levels; therefore, the predictions will be conducted during the impact assessment stage of the project. The background noise levels for the existing environmental conditions will be assumed as per the Ministry’s Environmental Guide for Noise, and updated during the impact assessment stage of the project, when sufficient information will be available for traffic noise predictions.

Most of the area surrounding the project is rural in nature with no obvious sources of traffic noise or other human caused noises. As such, the noise level due to existing conditions in those areas is tentatively assumed to be representative of a Class 3 rural area, with a future no-build noise level of 40 dBA.

The areas surrounding the project that would have elevated background noises caused by traffic and other human noise sources are those adjacent to the existing freeways (Highways 400 and 404), within the Town of Bradford West Gwillimbury, and adjacent to regional/arterial roadways (Yonge Street, 10th Sideroad, and Leslie Street). For these areas, the background noise levels are tentatively assumed to be representative of a Class 2 suburban area, with a future no-build noise level of 45 dBA.

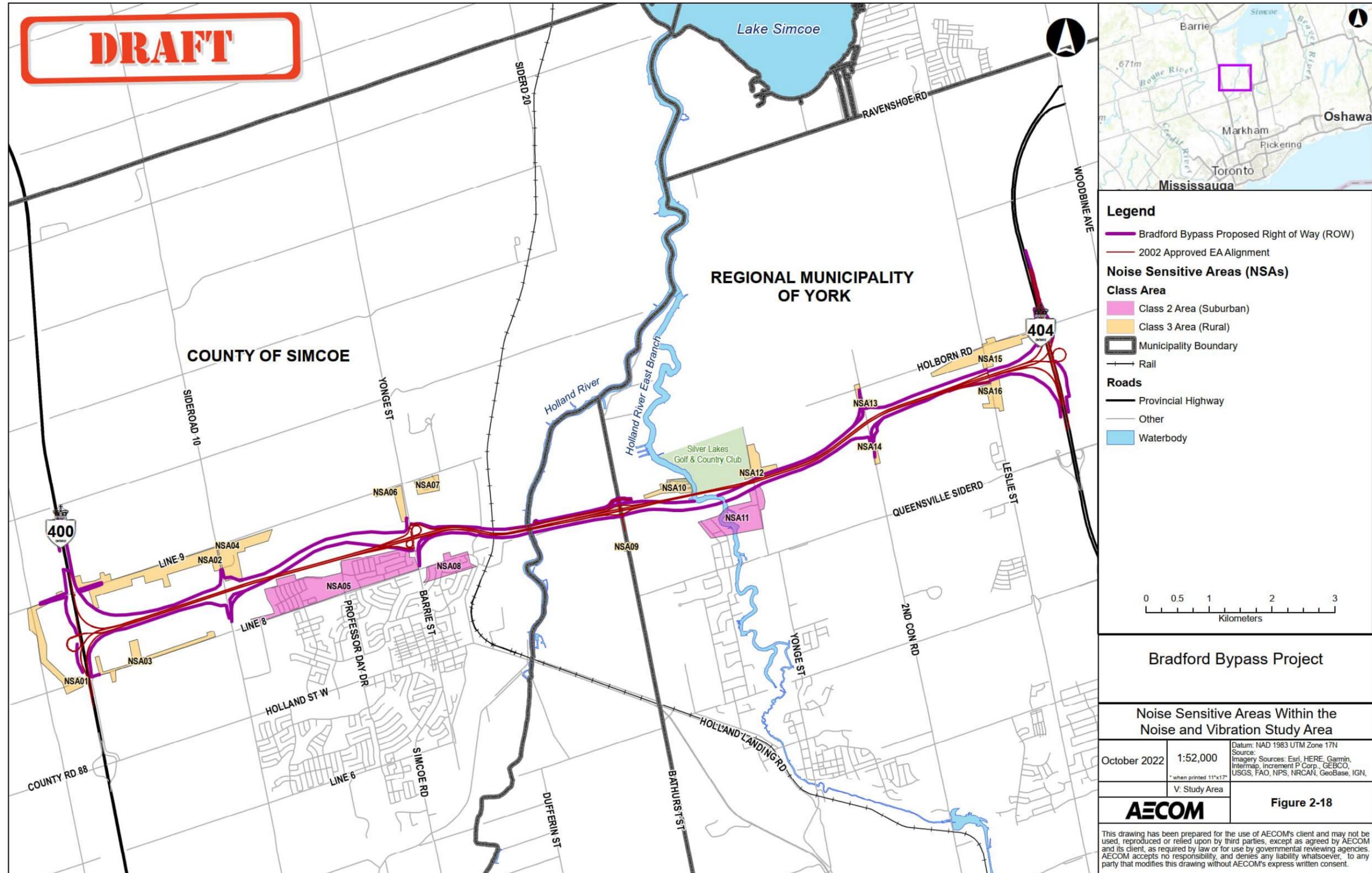
The assumed sound levels for the Class 2 and Class 3 areas may be updated during the impact assessment stage of the project based on available traffic data and in consultation with the Ministry of the Environment, Conservation and Parks. The traffic data will be used as inputs in a noise prediction model to determine the revised “future no build” conditions. However, if there is insufficient or no data available to complete these predictions at the impact assessment stage, then the Ministry guideline sound levels will be used based on the applicable Class Area for the identified Noise Sensitive Areas.

Table 2-24: Summary of Noise Sensitive Areas Within the Noise and Vibration Study Area

Noise Sensitive Area	Class Area	Description
NSA01⁽¹⁾	3	■ Scattered detached dwellings, west of future Highway 400 and Bradford Bypass interchange
NSA02	3	■ Scattered detached dwellings, 9 th Line between Highway 400 and 10 th Sideroad
NSA03⁽¹⁾	3	■ Scattered detached dwellings, 8 th Line between Highway 400 and 10 th Sideroad
NSA04	3	■ Detached dwellings, southeast of 9 th Line and 10 th Sideroad
NSA05⁽¹⁾	2	■ Detached dwellings, 8 th Line, between 10 th Sideroad and Yonge Street, including new school
NSA06⁽¹⁾	3	■ Scattered detached dwellings, southwest of 9 th Line and Yonge Street
NSA07⁽¹⁾	3	■ Detached dwellings, Grandview Crescent
NSA08	2	■ Detached dwellings, 8 th Line east of Yonge/Barrie Street, and potential future high-density development on north side of 8 th Line
NSA09	3	■ Scattered detached dwellings, Bathurst Street, south of Hochreiter Road
NSA10	3	■ Single detached dwelling and marina, Bathurst Street near Hochreiter Road
NSA11⁽¹⁾	2	■ Detached dwellings near Yonge Street and Morgan Road East Gwillimbury
NSA12	3	■ Scattered detached dwellings, Yonge Street, adjacent to golf course
NSA13	3	■ Scattered detached dwellings, 2 nd Concession Road near Holborn Road
NSA14	3	■ Scattered detached dwellings, 2 nd Concession Road north of Queensville Sideroad
NSA15	3	■ Scattered detached dwellings, near Leslie Street and Holborn Road
NSA16	3	■ Scattered detached dwellings, Leslie Street north of Queensville Sideroad

Note: 1. Future developments identified within or immediately adjacent to this area.

Figure 2-18: Noise Sensitive Areas Within the Noise and Vibration Study Area



2.2.4 Air Quality

The air quality existing conditions assessment examines and summarizes the state of existing air quality levels within the Air Quality Study Area. This includes identifying existing sensitive and critical receptors, and existing industries which may have a contributing impact on local air quality levels.

The following sections outline the background, data collection and describe the existing environmental conditions within the Air Quality Study Area.

2.2.4.1 Background

The 2002 Approved Environmental Assessment did not include an air quality assessment or description of air quality existing conditions within the Study Area. A description of the existing air quality conditions within the Air Quality Study Area is included in the following sections below.

The Preliminary Design preparatory work Land Use Factors Existing Conditions Report completed in February 2020 (AECOM, 2020) provided a description of land use environmental conditions within the Study Area, which was reviewed as part of the air quality existing conditions assessment. Refer to **Section 2.2.1** for updated land use existing conditions within the Land Use and Property Study Area. An Air Quality Impact Assessment will be completed and summarized in the Environmental Impact Assessment Report, under separate cover.

2.2.4.2 Data Collection

The Air Quality Existing Conditions Assessment was prepared in accordance with the Ministry's Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (2020), which specifies the following contaminants as key contaminants emitted from roadway vehicle operations:

1. Carbon monoxide, CO
2. Nitrogen dioxide, NO₂
3. Particulate matter (<10 microns), PM₁₀
4. Particulate matter (<2.5 microns), PM_{2.5}
5. Benzene
6. 1,3-butadiene
7. Formaldehyde

8. Acetaldehyde
9. Acrolein
10. Benzo(a)pyrene (BaP)
11. Sulphur dioxide, SO₂.

A desktop review of existing industrial and commercial sources within the Air Quality Study Area was conducted. The Ministry of the Environment, Conservation and Parks Access Environment database showing all existing Environmental Compliance Approvals and Air Emission Environmental Activity and Sector Registrations was reviewed to identify sources of air emissions within the Air Quality Study Area.

Air quality standards for these contaminants are available from the Provincial Ambient Air Quality Criteria (AAQC) and Federal Canadian Ambient Air Quality Standards (CAAQS). **Table 2-25** displays these standards, which were developed based on a variety of criteria for human health and well-being.

2.2.4.3 Description of Environmental Conditions

2.2.4.3.1 Background Air Quality

The baseline ambient air quality levels were based on publicly available historical data from ambient air quality monitoring stations within Ontario. Data utilized is the most recent publicly available at the time of the preparation of this Report. The following National Air Pollution Surveillance air quality monitoring stations were selected as representative of the ambient air quality within the Air Quality Study Area:

- Roadside Wallberg (University of Toronto) (National Air Pollution Surveillance Identification 60439)
- Newmarket (National Air Pollution Surveillance Identification 65101)
- Toronto North Downsview (National Air Pollution Surveillance Identification 60440)
- Gage Institute (National Air Pollution Surveillance Identification 60427).

Table 2-25: Air Quality Criteria and Standards

Criteria Air Contaminant	Averaging Period (hr)	Standard Limit (ug/m ³)	Standard Source
NO ₂	1	400	Ambient Air Quality Criteria
NO ₂	1	119	Canadian Ambient Air Quality Standards (2020)
NO ₂	1	83	Canadian Ambient Air Quality Standards (2025) ¹
NO ₂	24	200	Ambient Air Quality Criteria
NO ₂	Annual	34	Canadian Ambient Air Quality Standards (2020)
NO ₂	Annual	24	Canadian Ambient Air Quality Standards (2025) ¹
CO	1	36200	Ambient Air Quality Criteria
CO	8	15700	Ambient Air Quality Criteria
SO ₂	1	193	Canadian Ambient Air Quality Standards (2020)
SO ₂	1	179	Canadian Ambient Air Quality Standards (2025) ²
SO ₂	1	106	Ambient Air Quality Criteria
SO ₂	10 min	178	Ambient Air Quality Criteria
SO ₂	Annual	11	Ambient Air Quality Criteria
SO ₂	Annual	14	Canadian Ambient Air Quality Standards (2020)
SO ₂	Annual	11	Canadian Ambient Air Quality Standards (2025)
PM ₁₀	24	50	Ambient Air Quality Criteria
PM _{2.5}	24	27	Canadian Ambient Air Quality Standards ³
PM _{2.5}	Annual	8.8	Canadian Ambient Air Quality Standards ³
Acetaldehyde	30 min	500	Ambient Air Quality Criteria
Acetaldehyde	24	500	Ambient Air Quality Criteria
Acrolein	1	4.50	Ambient Air Quality Criteria
Acrolein	24	0.40	Ambient Air Quality Criteria
Benzene	24	2.30	Ambient Air Quality Criteria
Benzene	Annual	0.45	Ambient Air Quality Criteria
Benzo(a)pyrene	24	0.00005	Ambient Air Quality Criteria
Benzo(a)pyrene	Annual	0.00001	Ambient Air Quality Criteria
1,3-Butadiene	24	10	Ambient Air Quality Criteria
1,3-Butadiene	Annual	2	Ambient Air Quality Criteria
Formaldehyde	24	65	Ambient Air Quality Criteria

Notes: (1) Standard value from Canadian Ambient Air Quality Standards for NO₂ is 42 ppb for the 1-hour averaging period and 12 ppb for the Annual averaging period. Standard converted to µg/m³ using a temperature of 10 degrees Celsius and pressure of 1 atm. The statistical form of the 1-hour standard is based on a 3-year average of the 98th percentile of the daily maximum 1-hour average concentrations. The annual standard is based on an average over a single calendar year of all 1-hour average concentrations.

(2) Standard value from Canadian Ambient Air Quality Standards for SO₂ is 65 ppb for the 1-hour averaging period and 4.0 ppb for the Annual averaging period. Standard converted to µg/m³ using a temperature of 10 degrees Celsius and pressure of 1 atm. The Annual averaging period was higher than the Ambient Air Quality Criteria Standard for the same averaging period and is therefore excluded from the table. The statistical form of the 1-hour standard is based on a 3-year average of the 99th percentile of the daily maximum 1-hour average concentrations.

(3) The statistical form of the PM_{2.5} 24-hour Canadian Ambient Air Quality Standards standard is based on a 3-year average of the 98th percentile of the daily 24-hour average concentrations. The annual Canadian Ambient Air Quality Standards standard is based on a 3-year average of the daily 24-hour average concentrations.

These stations are located nearest to the Air Quality Study Area and monitored (in combination) all relevant Criteria Air Contaminants for the assessment, since one station is unable to monitor all Criteria Air Contaminants. Where multiple stations were found to monitor a common Criteria Air Contaminant, the closest representative station was selected for the assessment. Details of the air quality monitoring stations and their distance in kilometres to the Air Quality Study Area are provided in **Table 2-26**.

Ambient monitoring data was collected for all contaminants from the most recent data available, as per the averaging period(s) listed in **Table 2-27** through **Table 2-32**, and the following methodology was used for the calculations:

- 1 hour, 8 hour, and 24 hour ambient concentrations for the contaminants were obtained from the 90th percentile of hourly measurements from the representative air quality monitoring stations (the average value was calculated from the available years)
- Annual ambient concentrations for the contaminants were obtained from the mean measurements from the representative air quality monitoring station
- The average value was calculated from the available years, when compared to the Ambient Air Quality Criteria
- The average of the most recent 3 years used for PM_{2.5}, when compared to Canadian Ambient Air Quality Standards
- The maximum annual average value from the available years used for NO₂ and SO₂, when compared to the Canadian Ambient Air Quality Standards.

Table 2-26: Air Quality National Air Pollution Surveillance Monitoring Station Information

Station Information	Roadside Wallberg University of Toronto	Newmarket	Toronto North Downsview	Gage Institute
National Air Pollution Surveillance No.	60439	65101	60440	60427
Address	200 College Street	Eagle St. & McCaffrey Road	4905 Dufferin Street	223 College Street
Years of Data Available	2014 – 2017	2016 – 2020	2017 – 2020	2010 – 2014
Latitude	43.6590	44.0443	43.7804	43.6582
Longitude	-79.3954	-79.4833	-79.4675	-79.3972
Station Type	Urban	Urban	Urban	Urban
Criteria Air Contaminants Measured	Carbonyls (Formaldehyde, Acetaldehyde, Acrolein)	Benzene, 1,3-Butadiene, NO ₂ , PM _{2.5} , Ozone	CO, SO ₂	PAH (Benzo(a)pyrene)
Distance from Air Quality Study Area	53.10 kilometres	9.58 kilometres	37.39 kilometres	52.32 kilometres

Table 2-27: Background Ambient Air Quality Concentrations (2016-2020)

Criteria Air Contaminant	Station ID	Averaging Period ^[1] (hr)	Units	MW (g/mol)	90th Percentile Concentrations 2016	90th Percentile Concentrations 2017	90th Percentile Concentrations 2018	90th Percentile Concentrations 2019	90th Percentile Concentrations 2020	90th Percentile Concentrations 5-Year Average
NO₂	65101	1	ppb	46.01	15.00	14.00	13.00	13.00	10.00	13.00
NO₂	65101	24	ppb	46.01	13.08	11.22	11.75	11.73	9.30	11.42
NO₂	65101	Annual ¹	ppb	46.01	6.49	6.29	6.10	5.48	4.50	5.77
PM₁₀ ^[2]	65101	24	µg/m ³	-	20.68	19.63	21.02	21.17	19.52	20.33
PM_{2.5}	65101	24	µg/m ³	-	11.17	10.60	11.35	11.43	10.54	10.98
PM_{2.5}	65101	Annual	µg/m ³	-	6.02	5.94	6.36	5.93	5.94	6.04
Benzene	65101	24	µg/m ³	-	0.55	0.59	0.56	0.42	0.42	0.55
Benzene	65101	Annual	µg/m ³	-	0.34	0.38	0.34	0.27	0.35	0.34
1,3-Butadiene	65101	24	µg/m ³	-	0.04	0.04	0.03	0.02	0.02	0.03
1,3-Butadiene	65101	Annual	µg/m ³	-	0.02	0.02	0.02	0.01	0.01	0.02
Ozone	65101	1	ppb	48.00	43.00	42.00	46.00	41.00	41.00	43.00
Ozone	65101	24	ppb	48.00	38.10	37.44	41.42	37.50	38.01	38.56
Ozone	65101	Annual	ppb	48.00	28.58	27.90	29.77	27.76	28.52	28.51

Notes: (1) Annual values were based on average of all available data and was not based on 90th percentile concentration for all contaminants.

(2) PM₁₀ was not included in National Air Pollution Surveillance Station measurements, and therefore was estimated using PM_{2.5} measurements, assuming a ratio of 1 mg/m³ PM₁₀ per 0.54 mg/m³ of PM_{2.5} as per Lall et. al, "Estimation of historical annual PM_{2.5} exposures for health effects assessment", Atmospheric Environment 38 (2004).⁵

5. Lall, R., M. Kendall, K. Ito and G.D. Thurston, 2004: Estimation of historical annual PM_{2.5} exposures for health effects assessment (Atmospheric Environment. 38, 2004), 5217-5226.

Table 2-28: Background Ambient Air Quality Concentrations (2017-2021)

Criteria Air Contaminant	Station ID	Averaging Period ^[1] (hr)	Units	MW (g/mol)	90th Percentile Concentrations 2017	90th Percentile Concentrations 2018	90th Percentile Concentrations 2019	90th Percentile Concentrations 2020	90th Percentile Concentrations 2021	90th Percentile Concentrations 5-Year Average
CO	60440	1	ppm	28.01	0.33	0.30	0.29	0.27	ND	0.30
CO	60440	8	ppm	28.01	0.31	0.29	0.29	0.26	ND	0.29
SO ₂	60440	1	ppb	64.07	0.50	0.50	0.30	0.40	ND	0.40
SO ₂	60440	10 min	ppb	64.07	0.83	0.83	0.50	0.66	ND	0.66
SO ₂	60440	Annual	ppb	64.07	0.19	0.26	0.15	0.15	ND	0.46

Notes: (1) Annual values were based on average of all available data and was not based on 90th percentile concentration for all contaminants.

Table 2-29: Background Ambient Air Quality Concentrations (2014-2018)

Criteria Air Contaminant	Station ID	Averaging Period (hr)	Units	MW (g/mol)	90th Percentile Concentrations 2014	90th Percentile Concentrations 2015	90th Percentile Concentrations 2016	90th Percentile Concentrations 2017	90th Percentile Concentrations 2018	90th Percentile Concentrations 5-Year Average
Acetaldehyde	60439	24	µg/m ³	-	1.53	1.99	1.15	1.68	ND	1.69
Acrolein	60439	1	µg/m ³	-	0.18	0.17	0.11	0.15	ND	0.17
Acrolein	60439	24	µg/m ³	-	0.07	0.07	0.04	0.06	ND	0.07
Formaldehyde	60439	24	µg/m ³	-	2.80	3.80	1.49	2.66	ND	3.16

Table 2-30: Background Ambient Air Quality Concentrations (2010-2014)

Criteria Air Contaminant	Station ID	Averaging Period ^[1] (hr)	Units	MW (g/mol)	90th Percentile Concentrations 2010	90th Percentile Concentrations 2011	90th Percentile Concentrations 2012	90th Percentile Concentrations 2013	90th Percentile Concentrations 2014	90th Percentile Concentrations 5-Year Average
Benzo(a)pyrene	60427	24	ng/m ³	-	0.15	0.15	0.13	0.10	0.07	0.13
Benzo(a)pyrene	60427	Annual	ng/m ³	-	0.12	0.09	0.08	0.06	0.04	0.08

Notes: (1) Annual values were based on average of all available data and was not based on 90th percentile concentration for all contaminants.

Table 2-31: 98th Percentile Background Ambient Air Quality Concentrations

Criteria Air Contaminant	Station ID	Averaging Period ^[1] (hr)	98th Percentile Concentrations (µg/m ³) 2016	98th Percentile Concentrations (µg/m ³) 2017	98th Percentile Concentrations (µg/m ³) 2018	98th Percentile Concentrations (µg/m ³) 2019	98th Percentile Concentrations (µg/m ³) 2020	3-Year Average ^[1]	3-Year Avg. 24-hr/Annual ^[1]
NO ₂	65101	1	40.00	36.00	41.00	42.74	36.44	41.25	-
NO ₂	65101	Annual	6.49	6.29	6.10	5.48	4.50	6.49	-
PM _{2.5}	65101	24	17.58	15.54	18.47	17.67	15.56	-	30.14
PM _{2.5}	65101	Annual	6.02	5.94	6.36	5.93	5.94	-	6.11

Notes: (1) Annual values were based on average of all available data and was not based on 98th percentile concentration for all contaminants.

Table 2-32: 99th Percentile Background Ambient Air Quality Concentrations

Criteria Air Contaminant	Station ID	Averaging Period (hr)	99th Percentile Concentrations (µg/m ³) 2017	99th Percentile Concentrations (µg/m ³) 2018	99th Percentile Concentrations (µg/m ³) 2019	99th Percentile Concentrations (µg/m ³) 2020	99th Percentile Concentrations (µg/m ³) 2021	Annual Max (SO ₂)
SO ₂	60440	1	6.00	5.40	5.42	4.19	ND	5.61

The background concentrations for each contaminant were also compared to the applicable Provincial Ambient Air Quality Criteria and Federal Canadian Ambient Air Quality Standards for the time averaging periods, as shown in **Table 2-33**.

As noted in red font below in **Table 2-33**, one contaminant was found to exceed the Provincial Ambient Air Quality Criteria in the existing ambient air levels. The exceedance for Benzo(a)pyrene is based on the existing levels within the downtown Toronto area⁶. It would be expected that measured levels of this contaminant would be lower in the region due to lower traffic volumes and other contributing emission sources within the Bradford West Gwillimbury community.

2.2.4.3.2 Land Use and Sensitive Receptors

The Air Quality Study Area contains land use zoned by the Town of Bradford West Gwillimbury, Township of King, and Town of East Gwillimbury. The land use is primarily zoned as either agricultural or rural, natural areas and open spaces, industrial and commercial, or residentially zoned. There also exists land use designated to community institutional, health and wellness, and railway corridors within the Air Quality Study Area.

Sensitive and critical receptors were identified within the Air Quality Study Area. Sensitive receptors are defined as “residential dwellings” and critical receptors are defined as “retirement homes, hospitals, childcare centres, schools and similar institutional buildings” within the Ministry’s Air Quality Guide. The location of identified critical receptors such as schools, day cares, or nursing homes, are listed in **Table 2-34**.

6. Selection of station for each contaminant was based on primarily proximity to the Air Quality Study Area and completeness of dataset. Specifically, in the case of Benzo(a)pyrene, the closest complete monitoring dataset was located in downtown Toronto.

Table 2-33: Comparison of Background Ambient Air Quality Data to Relevant Ambient Air Criteria/Standard

Criteria Air Contaminant	Station ID	Averaging Period (hr)	Years	Average of Background Data (ug/m ³)	Percentile	Standard Limit (ug/m ³)	Standard Source	% of Standard Limit
NO ₂	65101	1	2016-2020	25.74	90th	400	Ambient Air Quality Criteria	6%
NO ₂	65101	1	2016-2020	81.67	98th	119	Canadian Ambient Air Quality Standards (2020)	69%
NO ₂	65101	1	2016-2020	81.67	98th	83	Canadian Ambient Air Quality Standards (2025)	98%
NO ₂	65101	24	2016-2020	22.61	90th	200	Ambient Air Quality Criteria	11%
NO ₂	65101	Annual	2016-2020	12.85	Mean	34	Canadian Ambient Air Quality Standards (2020)	38%
NO ₂	65101	Annual	2016-2020	12.85	Mean	24	Canadian Ambient Air Quality Standards (2025)	54%
CO	60440	1	2017-2020	361.66	90th	36200	Ambient Air Quality Criteria	1%
CO	60440	8	2017-2020	349.60	90th	15700	Ambient Air Quality Criteria	2%
SO ₂	60440	1	2017-2020	15.46	99th	193	Canadian Ambient Air Quality Standards (2020)	8%
SO ₂	60440	1	2017-2020	15.46	99th	179	Canadian Ambient Air Quality Standards (2025)	9%
SO ₂	60440	1	2017-2020	1.10	90th	106	Ambient Air Quality Criteria	1%
SO ₂	60440	10 min	2017-2020	1.82	90th	178	Ambient Air Quality Criteria	1%
SO ₂	60440	Annual	2017-2020	1.28	Mean	11	Ambient Air Quality Criteria	12%
SO ₂	60440	Annual	2017-2020	0.72	Mean	13.79	Canadian Ambient Air Quality Standards (2020)	5%
SO ₂	60440	Annual	2017-2020	0.72	Mean	11.03	Canadian Ambient Air Quality Standards (2025)	6%
PM ₁₀	65101	24	2016-2020	20.33	90th	50.00	Ambient Air Quality Criteria	41%
PM _{2.5}	65101	24	2016-2020	17.91	98th	27.00	Canadian Ambient Air Quality Standards	66%
PM _{2.5}	65101	Annual	2016-2020	6.11	Mean	8.80	Canadian Ambient Air Quality Standards	69%
Acetaldehyde	60439	30 min	2014-2017	5.00	90th	500.00	Ambient Air Quality Criteria	1%
Acetaldehyde	60439	24	2014-2017	1.69	90th	500.00	Ambient Air Quality Criteria	0%
Acrolein	60439	1	2014-2017	0.17	90th	4.50	Ambient Air Quality Criteria	4%
Acrolein	60439	24	2014-2017	0.07	90th	0.40	Ambient Air Quality Criteria	17%
Benzene	65101	24	2016-2020	0.55	90th	2.30	Ambient Air Quality Criteria	24%
Benzene	65101	Annual	2016-2020	0.34	Mean	0.45	Ambient Air Quality Criteria	75%
Benzo(a)pyrene	60427	24	2010-2014	1.26E-04	90th	0.00005	Ambient Air Quality Criteria	252%
Benzo(a)pyrene	60427	Annual	2010-2014	7.73E-05	Mean	0.00001	Ambient Air Quality Criteria	773%
1,3-Butadiene	65101	24	2016-2020	0.03	90 th	10.00	Ambient Air Quality Criteria	0%
1,3-Butadiene	65101	Annual	2016-2020	0.02	Mean	2.00	Ambient Air Quality Criteria	1%
Formaldehyde	60439	24	2014-2017	3.16	90th	65.00	Ambient Air Quality Criteria	5%
Ozone	65101	1	2016-2020	88.83	90th	-	-	-
Ozone	65101	24	2016-2020	79.67	90th	-	-	-

Notes: (1) Exceedances to Air Quality criteria are shown in **red**.

- (2) Standard value from Canadian Ambient Air Quality Standards for NO₂ is 42 ppb for the 1-hour averaging period and 12 ppb for the Annual averaging period. Standard converted to µg/m³ using a temperature of 10 degrees Celsius and pressure of 1 atm. The statistical form of the 1-hour background concentration is presented as a 3-year average of the 98th percentile of the daily maximum 1-hour average concentrations. The annual background concentration is presented as an average over a single calendar year of all 1-hour average concentrations.
- (3) Standard value from Canadian Ambient Air Quality Standards for SO₂ is 65 ppb for the 1-hour averaging period and 4.0 ppb for the Annual averaging period. Standard converted to µg/m³ using a temperature of 10 degrees Celsius and pressure of 1 atm. The Annual averaging period was higher than the Ambient Air Quality Criteria Standard for the same averaging period and is therefore excluded from the table. The statistical form of the 1-hour background concentration is presented as a 3-year average of the 99th percentile of the daily maximum 1-hour average concentrations.
- (4) The statistical form of the PM_{2.5} 24-hour background concentration is presented as a 3-year average of the 98th percentile of the daily 24-hour average concentrations. The annual background concentration is presented as a 3-year average of the daily 24-hour average concentrations.

Table 2-34: Identified Critical Receptors Within the Air Quality Study Area

Receptor ID	Type	Address	Description	UTM Co-ordinates Easting (m)	UTM Co-ordinates Northing (m)
CR1	Critical	511 Queensville Sideroad Holland Landing, ON L9N 0G1	Retirement Home	621582.68	4887574.43
CR2	Critical	20317 Leslie St, East Gwillimbury, ON L0G 1R0	School	624052.00	4887964.00
CR3	Critical	20728 Leslie St, Queensville, ON L0G 1R0	School	623797.00	4889056.00
CR4	Critical	552 Holland St W, Bradford, ON L3Z 4H3	Retirement Home	612171.00	4884614.00
CR5	Critical	3053 9 th Line, Bradford, ON L3Z 2A5	School	611613.00	4887382.00
CR6	Critical	459 Holland St W, Bradford, ON L3Z 0C1	Daycare Centre	612768.00	4885030.00
CR7	Critical	70 Professor Day Dr, Bradford, ON L3Z 3B9	School	613540.00	4885302.00
CR8	Critical	40 Toronto St, Bradford, ON L3Z 1N6	Retirement Home	614288.00	4885501.00
CR9	Critical	20 Fletcher St, Bradford, ON L3Z 1L9	School	614590.00	4886181.00
CR10	Critical	40 John St W, Bradford, ON, L3Z 1J5	Daycare Centre	615819.61	4885623.57
CR11	Critical	127 Bridge St #12, Bradford, ON L3Z 3H2	Daycare Centre	614722.00	4885607.00
CR12	Critical	3131 8 th Line, Bradford, ON L3Z 4H2	Retirement Home	611575.00	4885892.00
CR13	Critical	43 Balmoral Heights, East Gwillimbury, ON L0G 1R0	Retirement Home	623720.00	4888650.00
CR14	Critical	402 Britannia Ave, Bradford, ON L3Z 1A7	Daycare Centre	615336.91	4886983.61
CR15	Critical	237 Sand Road, East Gwillimbury, ON L9N 1K1	Daycare Centre	619560.58	4886794.89
CR16	Critical	105 Colborne St, Bradford, ON L3Z 1C4	School	615130.89	4886025.94
CR17	Critical	100 Professor Day Dr, Bradford, ON L3Z 3B9	School	613500.61	4885688.23
CR18	Critical	110 Northgate Dr, Bradford, ON L3Z 2Z7	School	614003.45	4886244.38
CR19	Critical	3417 9 th Line, Bradford, ON L3Z 3S4	School	609867.93	4886723.15
CR20	Critical	20507 Leslie St, East Gwillimbury, ON L0G 1R0	Daycare Centre	623940.00	4888483.00

Table 2-35: Possible Future Receptor Areas Within the Air Quality Study Area

Receptor ID	Type	Description
FR1	Possible Future Sensitive Receptor	The lands adjacent to Hwy 400 were the subject of a Minister's Zoning Order to permit industrial uses. There were Three MZO's issued. Those MZO's were revoked (Ont. Reg. 181-20) after Bradford West Gwillimbury adopted the zoning over the lands. The lands are now designated and zoned for industrial purposes; however, development of the land relies on municipal services that are not yet available to the lands.
FR2	Possible Future Sensitive Receptor	Henderson Park is a municipal park providing a number of baseball and soccer playing fields. The Town is in the process of developing a multi-use plan for the park.
FR3	Possible Future Sensitive Receptor	3100 10 th Sideroad was draft plan approved for an industrial subdivision however that approval has lapsed. The plan had a 4-hectare block on the north side dedicated for the corridor. The Owners have recently discussed undertaking an Official Plan Amendment and Zoning By-law amendment to convert the lands from Employment to Residential.
FR4	Possible Future Sensitive Receptor	The Sargent Concrete property has draft plan approval for a subdivision for employment uses. A block was reserved for the corridor on the north side of the lands. These lands could be impacted by a new interchange in that location. Access to the site is limited to an extension of Crossland Blvd. to the east.
FR5	Possible Future Sensitive Receptor	The Simcoe County District School board has obtained zoning approval for a secondary school on this site.
FR6	Possible Future Sensitive Receptor	Pre-consultation has been completed to establish the requirements for an application for a medium density housing development on this site. The applications have not yet been filed.
FR7	Possible Future Sensitive Receptor	The area shown on Figure 2-20 is subject to policies that require that a Secondary Plan be approved before major development can proceed within the area. The property owners' group is working with the Town in the development of a Terms of reference for the Secondary Plan.
FR8	Possible Future Sensitive Receptor	2362 8 th Line is the subject of applications to permit a two-building Adult Lifestyle development. The current proposal is for 218 units.
FR9	Possible Future Sensitive Receptor	8 th Line and Artesian Industrial Parkway is the site of a proposed residential development. Pre-consultation has occurred, but no application filed at this time.

Figure 2-19: Critical Receptors Within the Air Quality Study Area

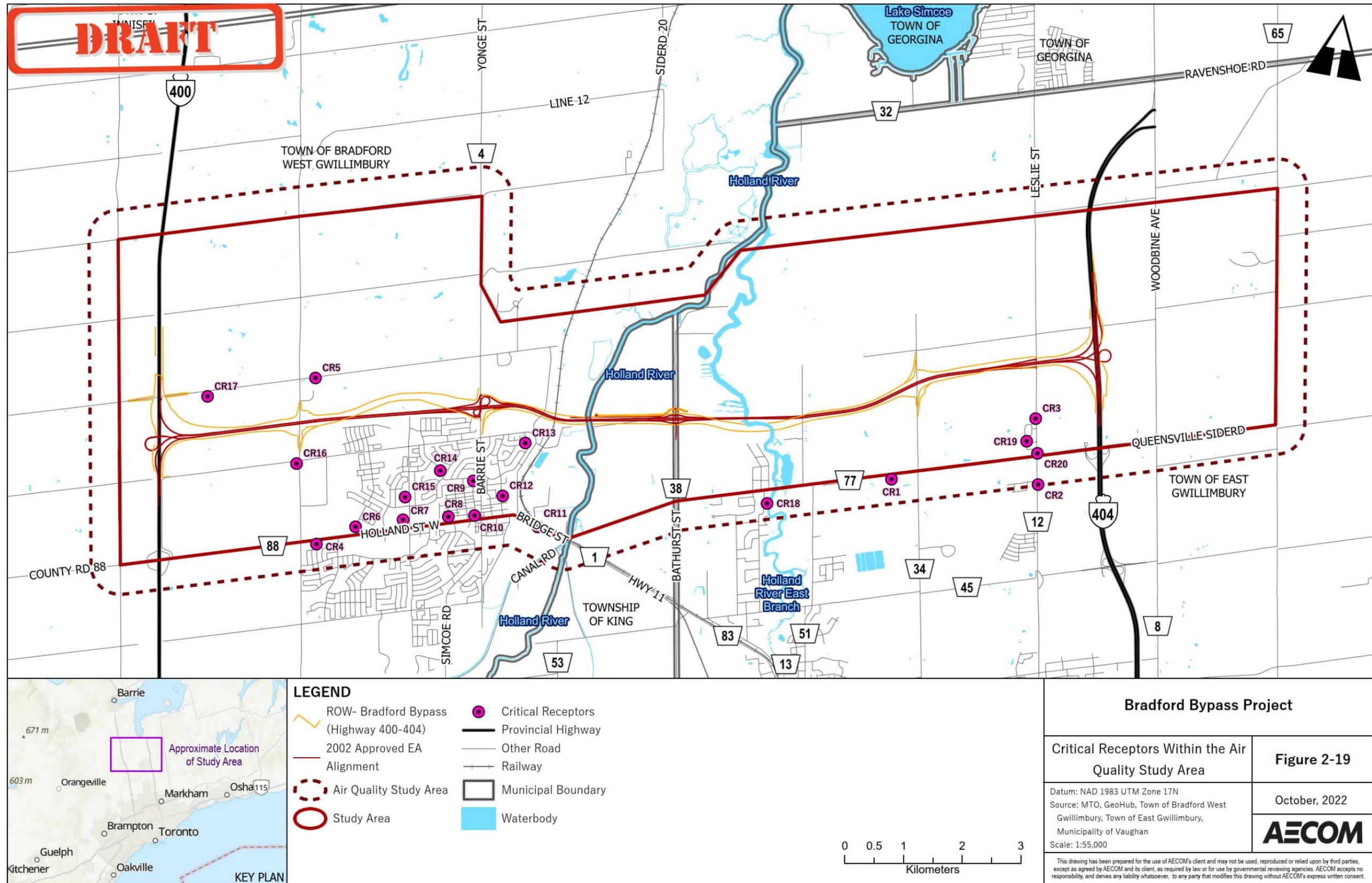
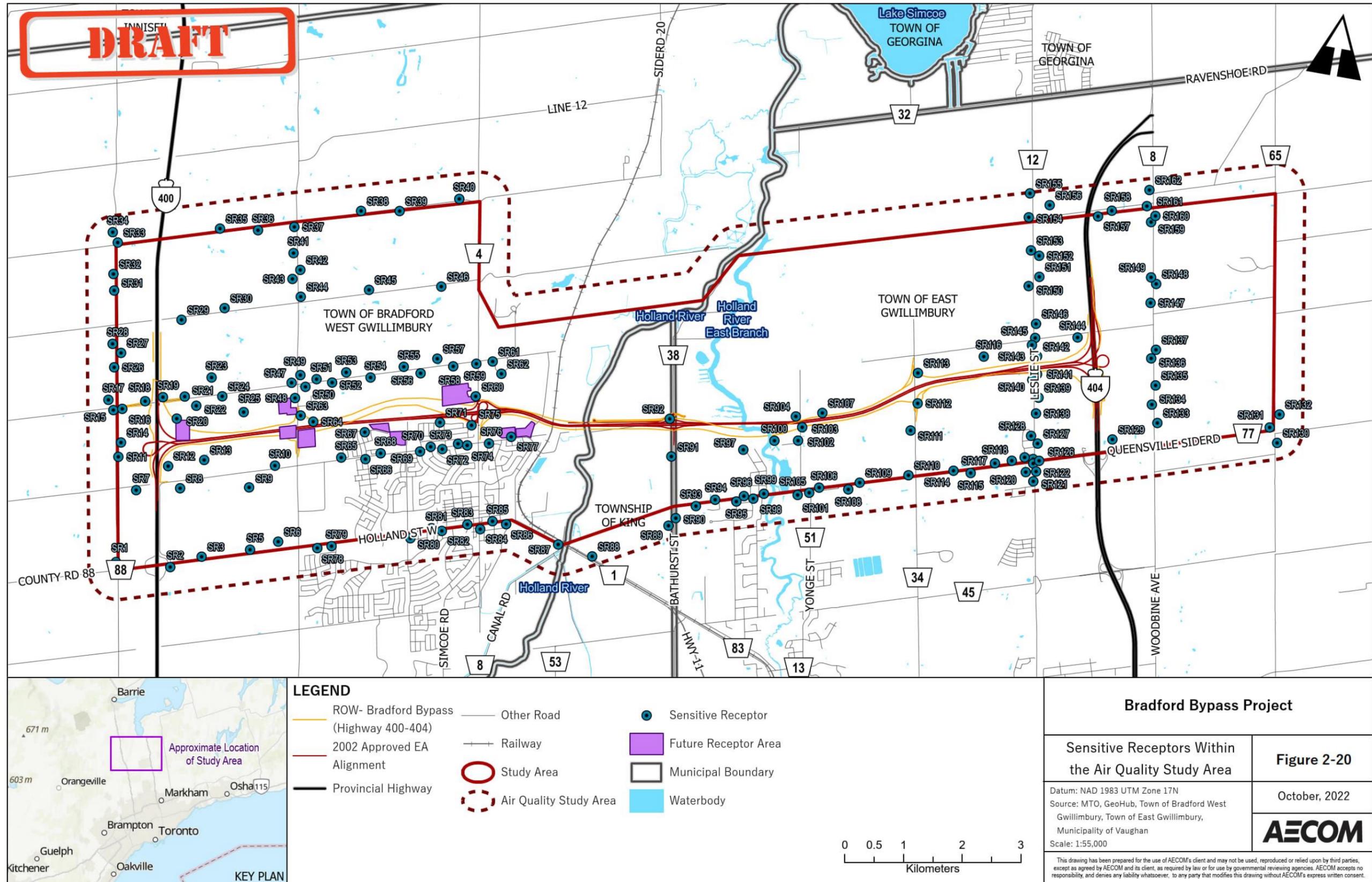


Figure 2-20: Sensitive Receptors Within the Air Quality Study Area



2.2.4.3.3 Existing Sources of Air Quality Impacts

The results of the desktop review noted the location of several industrial and commercial businesses, which operate within or just outside of the Air Quality Study Area. **Table 2-36** provides a list of these businesses and possible sources of emissions, which may contribute to the local air quality contaminant concentrations.

Air quality and greenhouse gas emission impacts will be considered as a criterion within the alternatives' assessment. Impacts will be considered based on the preferred alternative's possible impact to air quality and greenhouse gas emission, as well as its proximity to existing critical and sensitive receptors. An air quality impact assessment will be completed to determine and compare the project's potential impacts of both air quality contaminants and greenhouse gas emissions against existing conditions and future conditions where there is no change in infrastructure. Details regarding air quality will be summarized in the Environmental Impact Assessment Report, under separate cover.

The air quality impact assessment will include assessment for both construction and operational conditions to provide context and recommendations for possible mitigation options which may reduce the air quality and greenhouse gas emission impacts to the local air quality.

Table 2-36: Identified Commercial and Industrial Businesses Within the Air Quality Study Area

Business Name	Address	Potential Sources of Air Emissions
Spectra Aluminum Products Ltd.	■ 95 Reagens Industrial Parkway, Bradford	■ This business is a manufacturer of aluminum products and aluminum extrusions. Potential emissions may include carbon dioxide, methane, and nitrous oxide from the manufacturing process. The Environmental Compliance Approval Number for this facility is 0781-8ASS4R.
The Sarjeant Co. Ltd.	■ 3111 10th Sideroad, Bradford	■ This business involves the production and delivery of concrete. Potential emissions may include carbon dioxide and nitrogen oxides. The Environmental Compliance Approval Number for this facility is 9618-8T3NGY.
Dufferin Concrete Bradford	■ 215 Artesian Industrial Parkway, Bradford	■ This business is a ready mix concrete supplier. Potential emissions may include carbon dioxide and nitrogen oxides. The Environmental Compliance Approval Number for this facility is 4020-9NRQQF.
Lisbon Asphalt Products Limited	■ 275 Artesian Industrial Parkway, Bradford	■ This business is an asphalt mixes manufacturer, paving contractor, and asphalt and concrete recycling business. Potential emissions may include particulate matter and volatile organic compounds. The Environmental Compliance Approval Number for this facility is 2055-BA3SWJ.
Con-Dura Ready Mix Inc	■ 250 Artesian Industrial Parkway, Bradford	■ This business is a ready mix concrete supplier. Potential emissions may include carbon dioxide and nitrogen oxides.
Press Equipment MSM Inc	■ 11 Daniele Cres, Bradford	■ This business provides metal stamping machinery services. Potential emissions may include particulate matter, carbon dioxide, sulphur oxides, nitrogen oxides, and carbon monoxide from the process. There is no registered Environmental Compliance Approval or Environmental Activity and Sector Registry for this facility.
R & C Ironworks Railings	■ 6 Industrial Ct #4, Bradford	■ This business is a manufacturer of iron and aluminum products (railings, gates, fences, etc.). Potential emissions may include carbon dioxide, methane, nitrogen oxides, and perfluorocarbons from the manufacturing process. There is no registered Environmental Compliance Approval or Environmental Activity and Sector Registry for this facility.
Flex-N-Gate	■ 75 Reagens Industrial Parkway, Bradford	■ This business is a manufacturer of automotive products and systems. This includes products containing metals and plastics. Potential emissions may include particulate matter, carbon dioxide, sulphur oxides, nitrogen oxides, and carbon monoxide from the process. The Environmental Compliance Approval Number for this facility is 1403-54PKB8.
Vins Plastics	■ 12 Industrial Court, Bradford	■ This business is a paper, plastic, and foil packaging business. Potential emissions may include carbon dioxide, nitrogen oxides, hydrofluorocarbons (HFC), and perfluorocarbons (PFC) from the manufacturing process. The Environmental Compliance Approval Number for this facility is 7581-8T8Q9L.
Royal Woodworking	■ 60 Industrial Road, Bradford	■ This business is a manufacturer and distributor of solid wood products. Potential emissions may include carbon dioxide, sulfur oxides, methane, and nitrogen oxides. The Environmental Compliance Approval Number for this facility is 1409-ADUQ8K.
Karlos Building Supplies	■ 20400 Hwy 11 South, Bradford	■ This business is a building supplier including lumber, aggregates, stone, masonry, brick, and block. Potential emissions may include carbon dioxide, particulate matter, and nitrogen oxides. There is no registered Environmental Compliance Approval or Environmental Activity and Sector Registry for this facility.

2.2.5 Contamination, Waste and Excess Materials Management

The contamination, waste and excess materials management existing conditions assessment examines and summarizes the state of existing contamination, waste and excess materials management within the Contamination, Waste and Excess Materials Management Study Area. This includes identifying existing high, medium and low potential contamination properties, and existing contamination potential ratings within the Contamination, Waste and Excess Materials Management Study Area.

The following sections outline the background, data collection and describe the existing environmental conditions within the Contamination, Waste and Excess Materials Management Study Area.

2.2.5.1 Background

The 2002 Approved Environmental Assessment included a high-level assessment of potential contamination within the Contamination, Waste and Excess Materials Management Study Area through identification of landfill sites and made recommendations for mitigation should waste material or contaminated soils be identified during further design or construction.

As part of the preparatory work for the re-initiation of the Bradford Bypass, AECOM conducted a Contamination Overview Study to identify properties / areas within the Contamination, Waste and Excess Materials Management Study Area with actual or potential site contamination that may impact future highway design; and, to identify appropriate future environmental work and mitigation measures to be implemented during the Preliminary Design, future Detail Design and construction phases of the project.

2.2.5.2 Data Collection

The Contamination Overview Study was conducted generally following the Ministry's Environmental Standards and Practices Users Guide dated December 2006 (Ministry of Transportation, 2006).

The Contamination Overview Study (AECOM, 2022) included research into the site history through the review of available aerial photographs, regulatory agency databases, municipal official plans, and available environmental reports and documents. The Contamination Overview Study did not include a reconnaissance of the Contamination, Waste and Excess Materials Management Study Area and/or interviews with property owners or occupants. Based on the information collected, data was further analyzed to evaluate the relative potential for and severity of contamination. Ratings of "high", "medium" or "low" potential for contamination were applied to the properties within the Contamination, Waste and Excess Materials Management Study Area.

A Waste and Excess Materials Management Plan is ongoing and will be prepared for the project in accordance with Ontario Regulation 406/19: On-site and Excess Soil Management. The Waste and Excess Materials Management Plan will be developed based on current understanding of applicable legislation, existing conditions, current land use, and planned future construction activities for the project. For construction-based activities to be undertaken responsibly and in a manner that is protective of both human health and the environment, basic foundation principles and industry standard practices for management of contaminated and/or excess material will be considered in the development of the Waste and Excess Materials Management Plan.

Field work for the Waste and Excess Materials Management Plan is ongoing in conjunction with the geotechnical and foundations investigations undertaken by Golder Associates Ltd. (Golder). Between May 2021 to June 2022 soil samples were collected from 33 boreholes. Locations of the boreholes for soil sampling were chosen where the properties identified high or medium risk of contamination based on the results outlined in the Contaminated Overview Study (AECOM, 2020). Refer to **Table 2-14** in **Section 2.1.4.3.2** for a summary of the Permit to Take Water Records.

Soil samples were screened for combustible organic vapours using a RKI GX-6000 photoionization detector, which was calibrated using isobutylene. In addition, field staff looked for potential visual indicators of soil contamination including staining or soil odours during the collection of samples; however, none were observed in the samples. Therefore, representative samples were submitted for laboratory analysis for PAHs, PHCs F1-F4, PCBs, VOCs, metals and inorganics, and mandatory testing of SPLP to support the requirements under Ontario Regulation 406/19.

Upon completing field investigation, the Waste and Excess Materials Management Plan will be completed outlining soil management planning, supporting and resources, implementation of mitigation measures, monitoring, evaluation, and reporting. Further, it should be noted that the Waste and Excess Materials Management Plan itself is a dynamic document that is anticipated to evolve and be updated based on changing legislation and/or specific requirements of the project, and will be summarized in the Environmental Impact Assessment Report, provided under a separate cover.

2.2.5.3 Description of Environmental Conditions

The assignment of ratings for potential contamination was based on the land use, the potential likelihood and severity of contamination, and an estimate of relative risk. The results of the contamination potential ratings for the properties within or partially within the Contamination, Waste and Excess Materials Management Study Area are illustrated in **Figure 2-21**.

Figure 2-21a: Contamination Potential Ratings

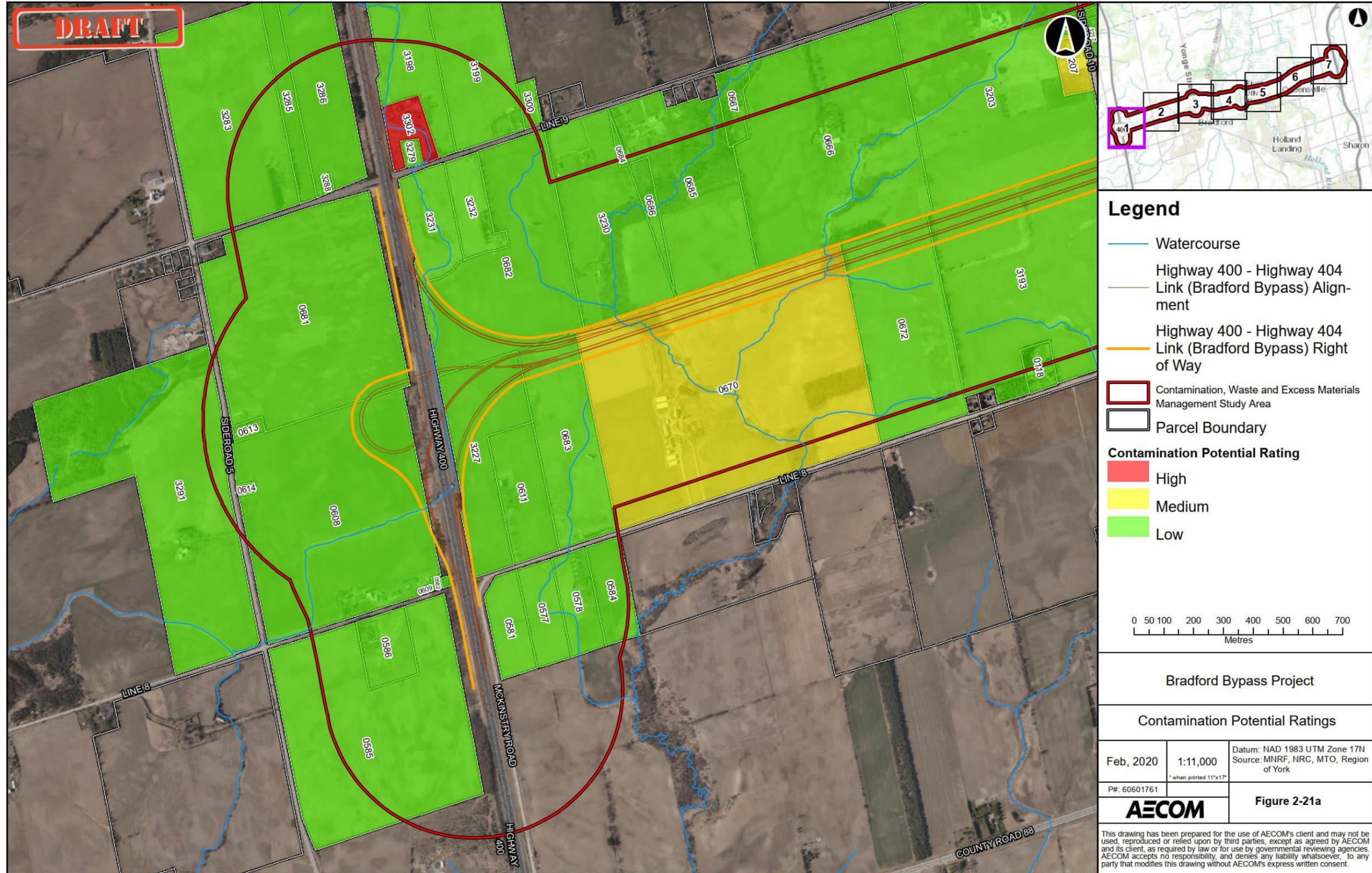


Figure 2-21b: Contamination Potential Ratings

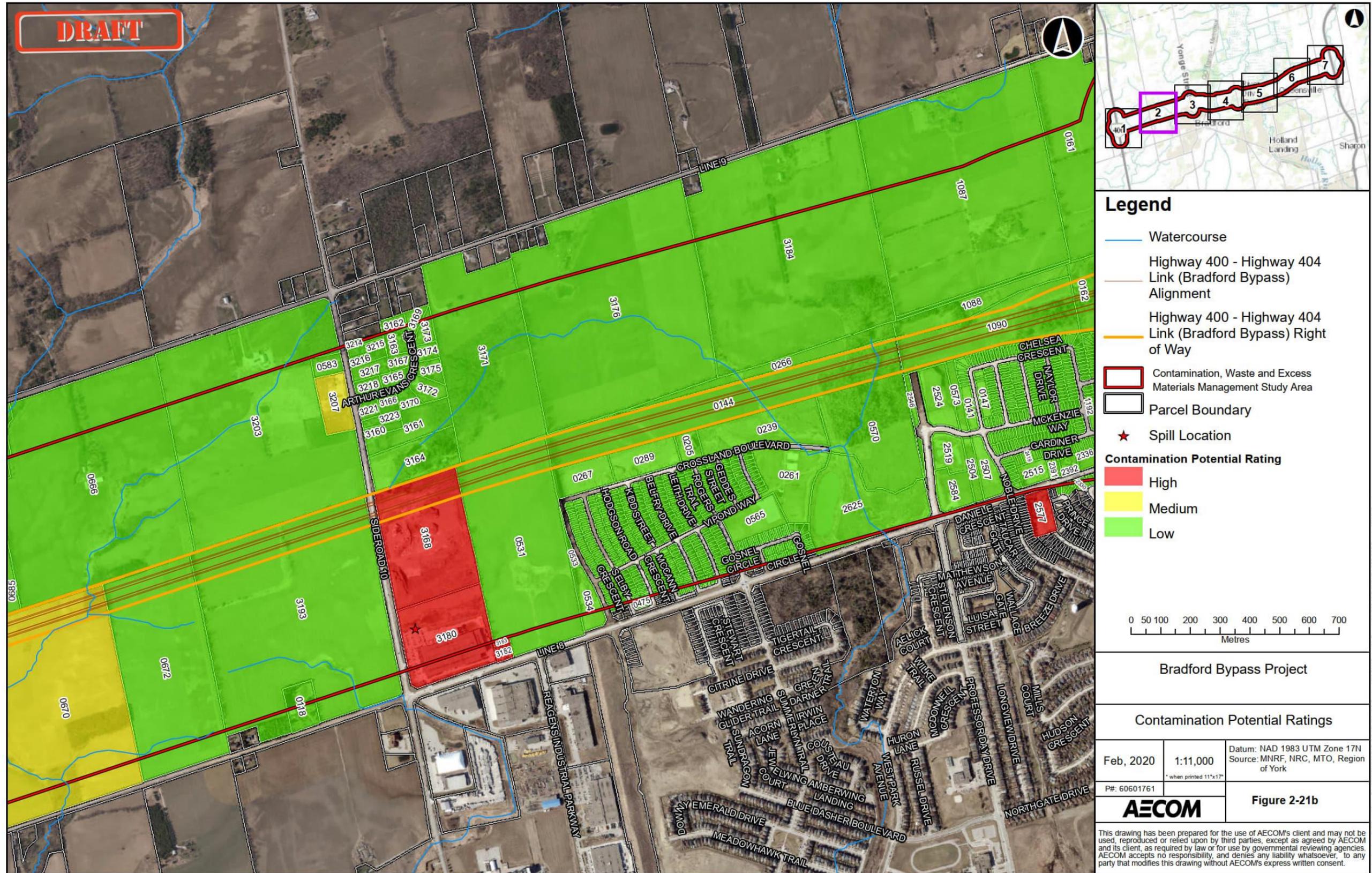


Figure 2-21c: Contamination Potential Ratings

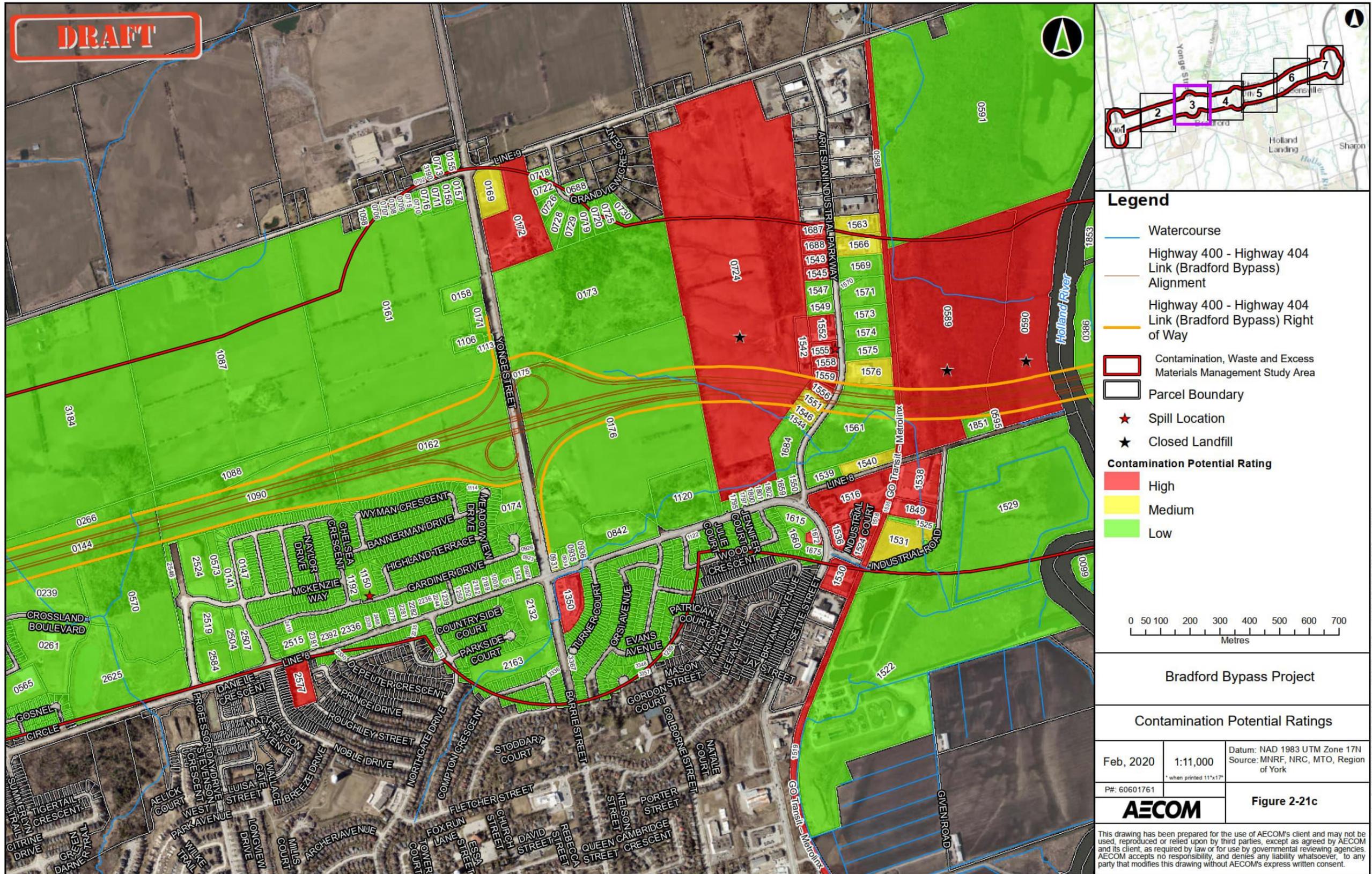


Figure 2-21d: Contamination Potential Ratings

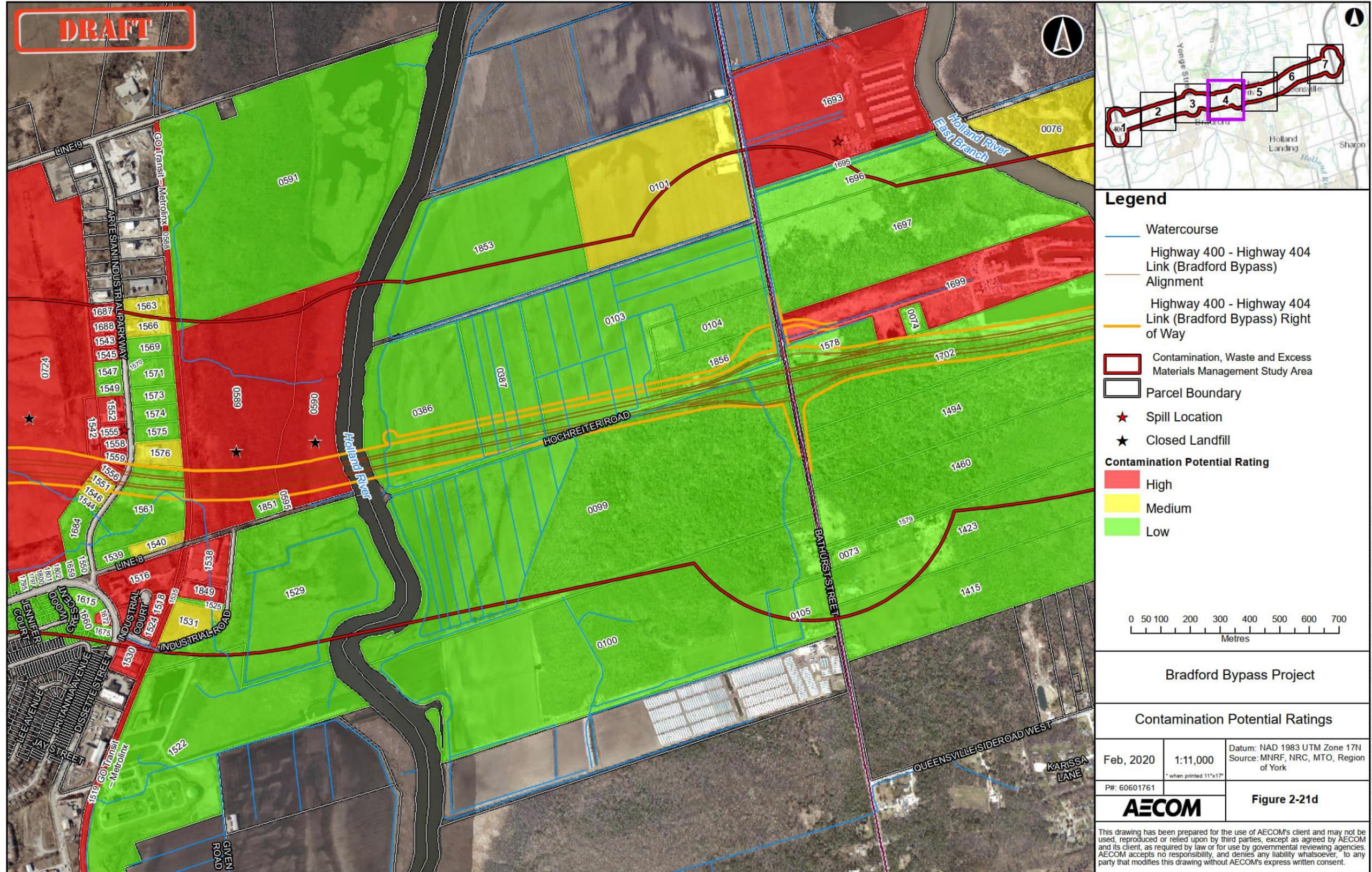


Figure 2-21e: Contamination Potential Ratings

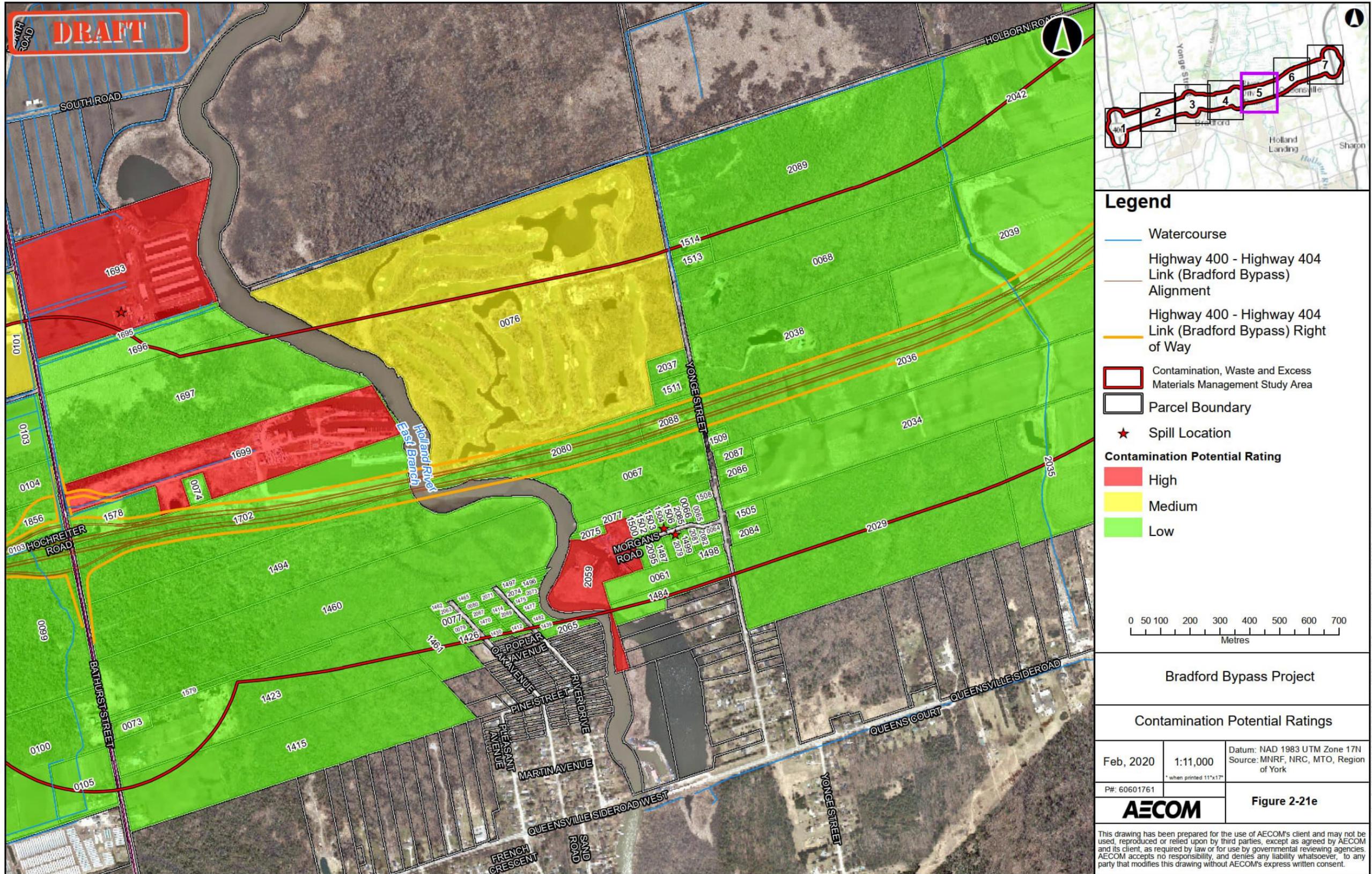


Figure 2-21f: Contamination Potential Ratings

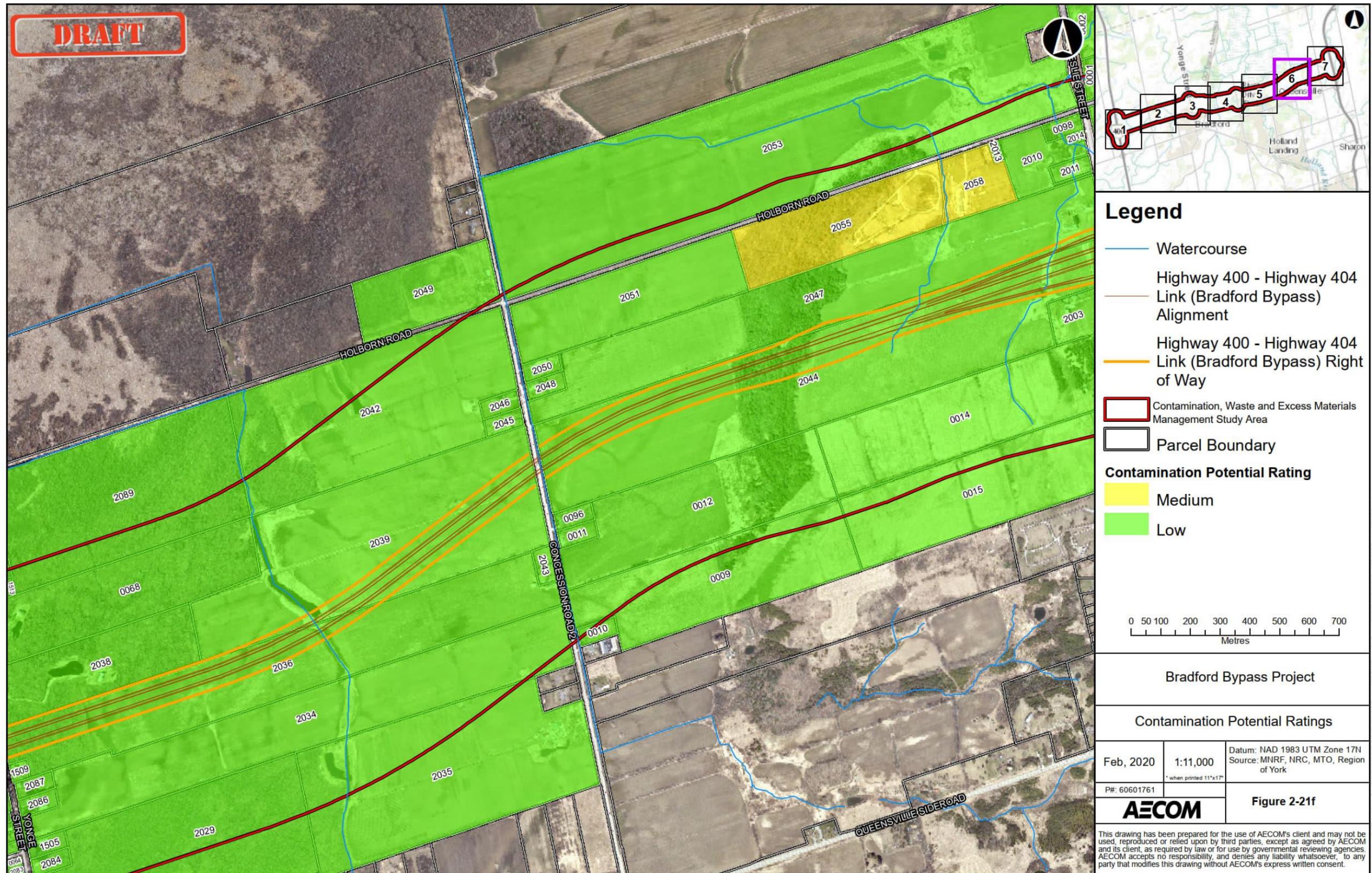
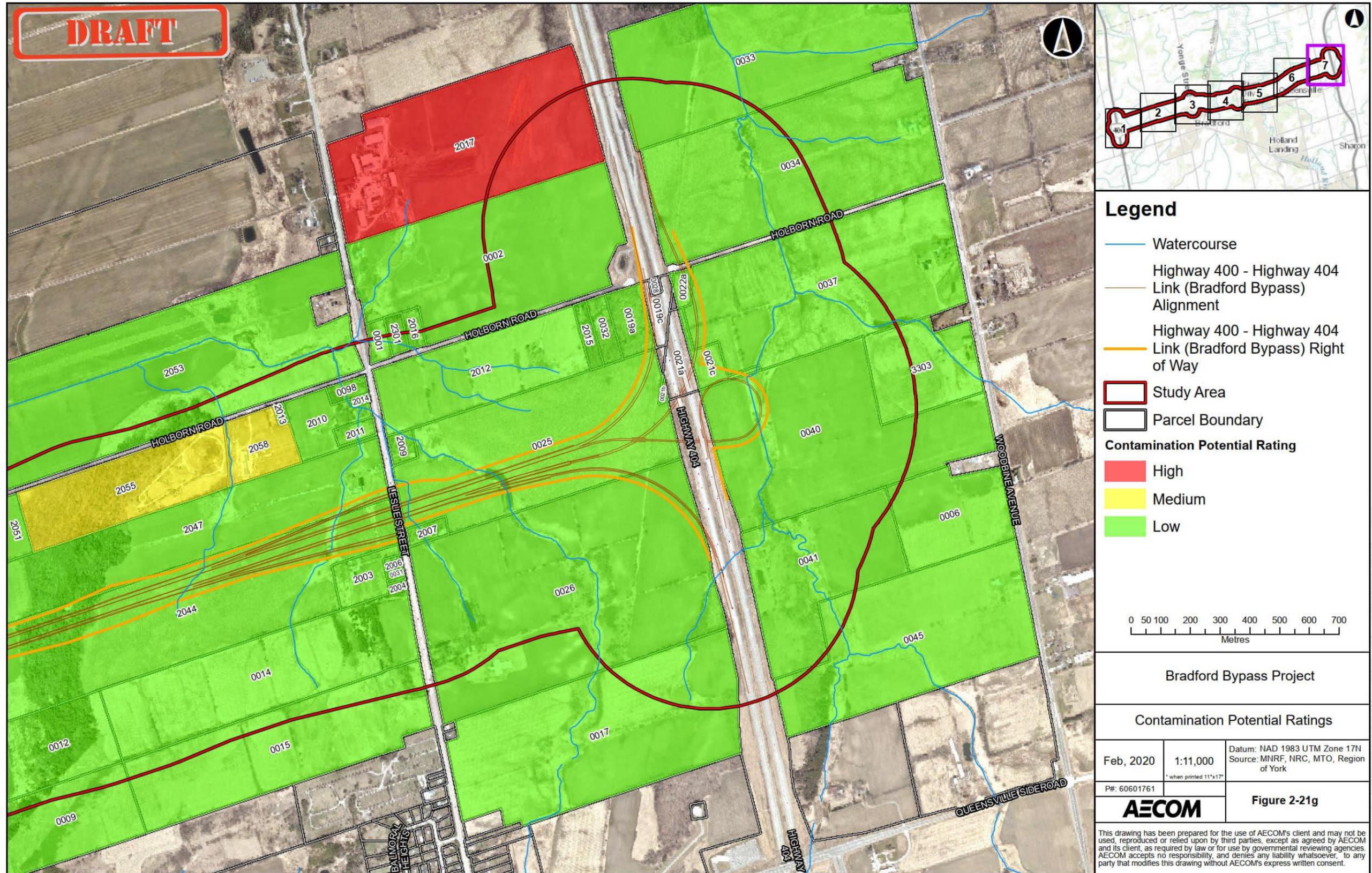


Figure 2-21g: Contamination Potential Ratings



High Potential Properties

Properties where land use consists of both current and historical industrial use, waste disposal sites and waste transfer sites are at a greater risk of having an environmental impact to the properties. The extent of contamination is generally more severe due to the industrial processes and materials involved. Potential environmental impacts related to waste disposal sites, landfills and dumps may extend to neighbouring properties if the containment fails or was not properly constructed. Some commercial operations, such as dry cleaners, vehicle and equipment repair, automobile wrecking yards or fuel service stations are also considered “high” risk. Certain agricultural properties, such as historical orchards are also considered high risk.

Soil contamination may also exist within the railway corridor beneath and / or adjacent to railway tracks as railways are often developed on poor quality fill and ballast material in addition to railway ties being impregnated with creosote.

In addition, properties with visible transformers, potential fill material of unknown quality, and where significant spills were reported were also considered as properties with “high” potential for contamination.

The Ministry of Environment, Conservation and Parks has also prepared a list of processes and operations that historically posed a higher risk of environmental impact, referred to as a “potentially contaminating activity”. Potentially contaminating activities must be identified and evaluated when preparing Phase I Environmental Site Assessment for filing Record of Site Conditions. In general, these potentially contaminating activities are considered to represent “high” potential for contamination, unless other information supports assigning a lower risk.

Medium Potential Properties

Properties where land uses consist of commercial use (with no evidence of “high” potential contaminating activities such as fuel / chemical storage tanks), light industrial businesses (such as shipping and receiving operations and light assembly); and vehicle equipment storage are given a relatively moderate risk rating of “medium”. Similarly, institutional facilities such as churches, public schools, nursing homes and community centres may have used or stored large quantities of chemical including heating oil and are ranked as “medium”, unless specific sources of information suggest that they have “high” or “low” potential.

Low Potential Properties

Properties where land use consist of open space, residential, or agricultural areas that are not suspected of using / generating chemical compounds harmful to the environment or human health have lower risk.

A major portion of the Contamination, Waste and Excess Materials Management Study Area crosses agricultural lands. In general, the potential for contamination on agricultural properties, except for orchards, are relatively low and mostly related to historic leaking from aboveground fuel storage tanks or on-site equipment repair. In addition, certain pesticides and fertilizers used on these agricultural lands can accumulate in the environment and remain for long periods of time. These contaminants can be transported through surface water runoff, wind and dust generation, and groundwater; and therefore, represent a potential for contamination. Although the concentrations and extents of these contaminants are usually not sufficient to affect roadway design, the presence of contaminants may cause local impacts that require management during roadway construction.

Road Salt Application and Vehicular Traffic

In addition to property specific contamination, based primarily on land use activities discussed above, there may also be regional potential contamination issues within the Contamination, Waste and Excess Materials Management Study Area.

Road salts (predominantly sodium chloride) are used as de-icing and anti-icing chemicals for winter road maintenance. These salts can enter the surface water, soil and groundwater resulting in local or widespread impacts. Since some portions of the Contamination, Waste and Excess Materials Management Study Area are along Highway 400 and Highway 404, major roadways such as Yonge Street, Leslie Street, industrial areas on Artesian Industrial Parkway, and near commercial properties with large parking lots, road salt contamination in proximity to the highways and parking lots represents a potential for contamination which may require off-site disposal of impacted soil and may limit operations for soil disposal.

Key Findings

Based on the records review, 29 properties / facilities (37 land parcels, note one facility may contain multiple parcels of land) within the Contamination, Waste and Excess Materials Management Study Area were identified as having a “high” potential for environmental contamination, while 14 properties / facilities (15 land parcels) were identified as having “medium” potential for environmental contamination. In addition, six significant spill locations were also identified as having a “high” potential to impact the soil and groundwater quality within the Contamination, Waste and Excess Materials

Management Study Area. The properties of “high” environmental concern include gas stations / service centres, auto body shops / garages, marinas, industrial or manufacturing sites, and the former landfill site.

Further environmental studies / investigations of those “high” and “medium” properties directly impacted by the construction of the Bradford Bypass would be recommended to confirm the environmental conditions on those lands in support of property acquisition, environmental due diligence, road construction and management of surplus / excess soil / materials. These further studies and investigations may include Phase One Environmental Site Assessments and Phase Two Environmental Site Assessments in accordance with Ontario Regulation 153/04. If contamination is identified through these investigations, mitigation measures will likely be required and shall be developed and implemented during Detail Design.

2.3 Cultural Environment

Cultural environment studies are being carried out to document and assess existing cultural environment features, outline the preliminary description of potential impacts of the project on the cultural environment, outline a description of potential measures to mitigate those impacts and identify applicable municipal, provincial, federal, or other regulatory approvals or permits associated with the cultural environment that may be required for the project.

Cultural environment existing conditions information will be detailed in discipline-specific existing condition and impact assessment reports to be completed during the Preliminary Design. The sections below summarize the study methodologies and describe the existing environmental conditions, for the following aspects of the cultural environment:

- Archaeology
- Built Heritage Resources and Cultural Heritage Landscapes.

2.3.1 Archaeology

Archaeological investigations for Stage 1 and 2 and any required Stage 3 and Stage 4 Archaeological Assessments will be completed in accordance with Ministry of Citizenship and Multiculturalism Standards and Guidelines for Consultant Archaeologists.

Under Section 21 of the Regulation, Stage 3 Archaeological Assessment shall be completed for areas of the Archaeology Study Area that are identified as having archaeological potential in accordance with Stage 2 Archaeological Assessment. A draft

Stage 1 Archaeological Assessment was completed in 2020 prior to the Preliminary Design and updated in 2022 to address comments received from the Ministry of Citizenship and Multiculturalism. The Stage 1 Archaeological Assessment was accepted by the Ministry of Citizenship and Multiculturalism on September 29, 2022. Stage 2 Archaeological Assessments are ongoing within the Archaeology Study Area.

Indigenous Nation representatives continue to be involved in field investigations for archaeological work for the project.

The following sections provide a summary of the Stage 1 Archaeological Assessment and current information on Stage 2 Archaeological Assessments during Preliminary Design, including information on where Stage 3 Archaeological Assessment are required.

2.3.1.1 Stage 1 Archaeological Assessment

2.3.1.1.1 Background

In 2020, AECOM completed a Stage 1 Archaeological Assessment for the project as part of the preparatory work in advance of the Preliminary Design for the project. The Stage 1 report documented the archaeological land use history and present conditions within the Study Area to support recommendations regarding cultural heritage values or interests as well as further assessment requirements and mitigation strategies to be advanced during Preliminary Design.

The draft Stage 1 Archaeological Assessment report is available on the Project Website (AECOM, Stage 1 Archaeological Assessment – Draft; Highway 400 – Highway 404 Link (Bradford Bypass) W.O. #19-2001, February 2020), under separate cover. The Study Area for the Stage 1 consisted of a 500 metre buffer around the right-of-way for the Technically Preferred Route (Figure 1, AECOM February 2020).

The Stage 1 report recognized the archaeological work documented in the 2002 Approved Environmental Assessment. At the time of the Route Planning study, a Stage 2 Archaeological Assessment was undertaken for an area from Yonge Street to the Holland River East Branch, to assess an area of the right-of-way that was 600 metres long and 100 metres wide. The assessment identified in the discovery of the Holland River East Branch site (BaGv-42) (Archaeological Services, Inc., 1997).

2.3.1.1.2 Methodology

The Stage 1 Archaeological Assessment included analyzing documentary sources, historic maps, detailed mapping, and satellite imagery in order to evaluate the archaeological potential within the Study Area. As directed by the Ministry, a property

inspection was not conducted as part of this assessment. The following sources were used for gathering information for the Stage 1 assessment:

- Recent and historical maps of the Study Area
- Reports of previous archaeological assessments within 50 metres of the Study Area
- The Ministry of Citizenship and Multiculturalism Archaeological Sites Database for a listing of registered archaeological sites within a 1 kilometre radius of the Archaeology Study Area
- Archaeological management plans or other archaeological potential mapping, where available.

The Stage 1 archaeological assessment was conducted to meet the requirements of the Standards and Guidelines (Ontario Government, 2011).

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the Ministry of Citizenship and Multiculturalism to determine areas of archaeological potential are listed in Section 1.3.1 of the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011). Distance to modern or ancient water sources is generally accepted as the most important element for past human settlement patterns and when considered alone may result in a determination of archaeological potential. In addition, any combination of two or more of the listed criteria indicates archaeological potential.

Based on a review of the historical, environmental, and archaeological context of the Archaeology Study Area, it has been determined that potential for the recovery of pre- and post-contact First Nation and 19th century Euro-Canadian archaeological resources within the Study Area is high based on the presence of the following features:

- Proximity to previously identified archaeological sites
- Distance to various types of water sources
- Soil texture and drainage
- Glacial geomorphology, elevated topography, and the general topographic variability of the area
- Resource areas including food or medicinal plants, scarce raw materials, and early Euro-Canadian industry
- Areas of early Euro-Canadian settlement and early transportation routes
- Properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupants.

Certain features indicate that archaeological potential has been removed, such as land that has been subject to extensive and intensive deep land alterations that have severely damaged the integrity of any archaeological resources. This includes landscaping that involves grading below the topsoil level, building footprints, quarrying and sewage and infrastructure development (Ontario Government, 2011).

All lands deemed to contain archaeological potential are subject to a Stage 2 archaeological assessment including a field survey, and if required, further Stage 3 and 4 archaeological assessments will be completed prior to any ground disturbance. Stage 2 assessments are undertaken in accordance with the Standards and Guidelines (Ontario Government, 2011) and include a pedestrian survey method at 5 metres intervals in areas which have been recently ploughed and weathered (at least 80% visibility). For lands that cannot be ploughed the Stage 2 assessment is done using the test pitting survey method as per Section 2.1.2 of the Standards and Guidelines. Stage 2 assessments are ongoing throughout the Archaeology Study Area.

In accordance with the draft technical bulletin entitled “Engaging Aboriginal Communities in Archaeology” the Indigenous communities with the closest cultural affiliation, or with interest in the project, were contracted to act as monitors during the Stage 2 archaeological assessment. Huron-Wendat Nation from Quebec and Curve Lake First Nation expressed interest in participating as monitors in the assessments, and Chippewas of Georgina Island First Nation and Chippewas of Rama First Nation requested to be kept apprised of field work updates. Further details regarding the Aboriginal Engagement for the Stage 2 archaeological assessment will be provided in a Statement of Aboriginal Engagement: Stage 2 Archaeological Assessment upon completion of the Stage 2 Archaeological Assessment field work and draft report.

2.3.1.1.3 Description of Environmental Conditions

AECOM’s Stage 1 assessment of the Archaeology Study Area has determined that the potential for the recovery of archaeological resources is high, given the proximity of the Archaeology Study Area to several indicators of archaeological potential, including previously identified archaeological sites, distance to important water sources, and areas of early Euro-Canadian settlement and early transportation routes. Areas where archaeological potential has been removed include areas determined to have been subject to extensive land alterations that have significantly compromised the recovery of archaeological materials and constructed roadways. Registered Archaeological Sites within the Archaeology Study Area are summarized in **Table 2-37**. The results of the Stage 1 Archaeological Assessment are shown on **Figure 2-22**.

Table 2-37: Registered Archaeological Sites within 1 kilometre of Stage 1 Archaeological Assessment Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Cultural Heritage Value or Interest	Proximity to the Stage 1 Study Area
BaGu-14	■ James	■ Indigenous Woodland	■ Findspot	■ Further Cultural Heritage Value or Interest	■ North of the Stage 1 Study Area
BaGu-137	■ Unknown	■ Unknown	■ Unknown	■ Unknown	■ Within Stage 1 Study Area
BaGu-150	■ Highway 404 New ROW	■ Unknown	■ Unknown	■ Unknown	■ South of the Stage 1 Study Area
BaGu-32	■ Merganser	■ Pre-contact Indigenous	■ Findspot	■ No Further Cultural Heritage Value or Interest	■ South of the Stage 1 Study Area
BaGu-50	■ Merlin	■ Pre-contact Indigenous	■ Findspot	■ No Further Cultural Heritage Value or Interest	■ South of the Stage 1 Study Area
BaGv-100	■ Unknown	■ Post-Contact Euro-Canadian	■ Unknown	■ Further Cultural Heritage Value or Interest	■ South of Stage 1 Study Area
BaGv-42	■ East Holland River	■ Post-Contact Euro-Canadian, Middle Woodland Indigenous	■ Homestead, Fishing	■ Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-49	■ Langford	■ Late Archaic Indigenous	■ Findspot	■ No Further Cultural Heritage Value or Interest	■ South of the Stage 1 Study Area
BaGv-54	■ Rogers site	■ Post-Contact Euro-Canadian	■ House	■ No Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-55	■ Unknown	■ Post-Contact Euro-Canadian	■ Homestead	■ No Further Cultural Heritage Value or Interest	■ Within Archaeology Study Area
BaGv-57	■ H1	■ Post-Contact	■ Homestead	■ No Further Cultural Heritage Value or Interest	■ South of the Stage 1 Study Area
BaGv-59	■ Belfry	■ Post-Contact Euro-Canadian	■ Homestead	■ No Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-62	■ Belfry	■ Euro-Canadian, Iroquoian Indigenous	■ Unknown	■ No Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-75	■ Unknown	■ Post-Contact Late Woodland Iroquoian	■ Village	■ Unknown	■ South of the Stage 1 Study Area
BaGv-76	■ Goldenlane H1	■ Post-Contact Euro-Canadian	■ Unknown	■ Unknown	■ South of the Stage 1 Study Area
BaGv-82	■ H4	■ Post-Contact Euro-Canadian	■ Homestead	■ Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-83	■ H2	■ Post-Contact Euro-Canadian	■ Homestead	■ Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-84	■ H3	■ Post-Contact	■ Unknown	■ Further Cultural Heritage Value or Interest	■ North of the Stage 1 Study Area
BaGv-95	■ Bond Head 4 Site	■ Post-Contact Euro-Canadian	■ Homestead	■ Further Cultural Heritage Value or Interest	■ Within Stage 1 Study Area
BaGv-97	■ Ferguson Site	■ Post-Contact Euro-Canadian	■ Homestead	■ No Further Cultural Heritage Value or Interest	■ South of the Stage 1 Study Area
BaGv-99	■ Unknown	Post-Contact Euro-Canadian	Scatter	No Further Cultural Heritage Value or Interest	Within Stage 1 Study Area

Figure 2-22a: Results of the Stage 1 Archaeological Assessment

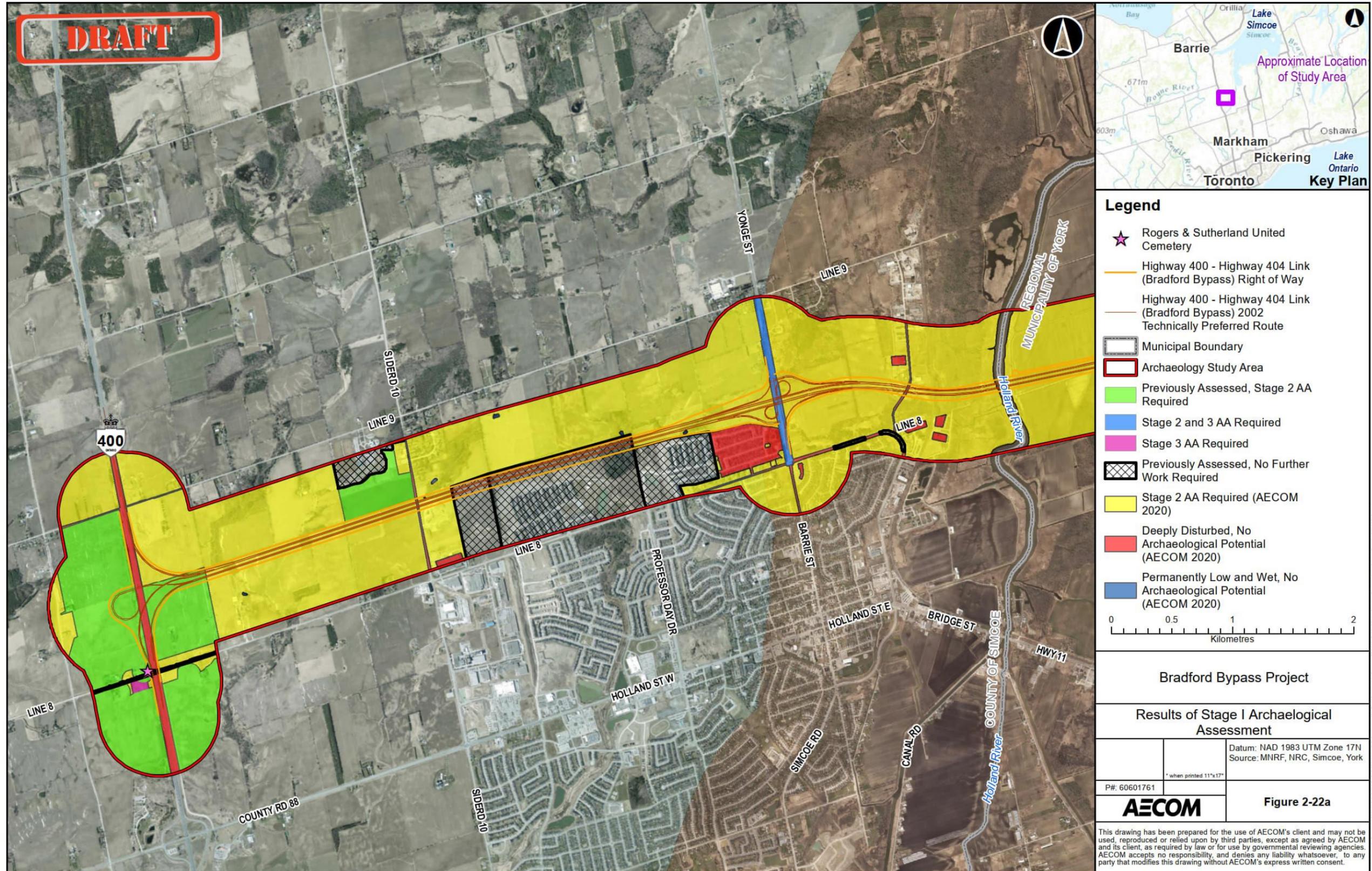
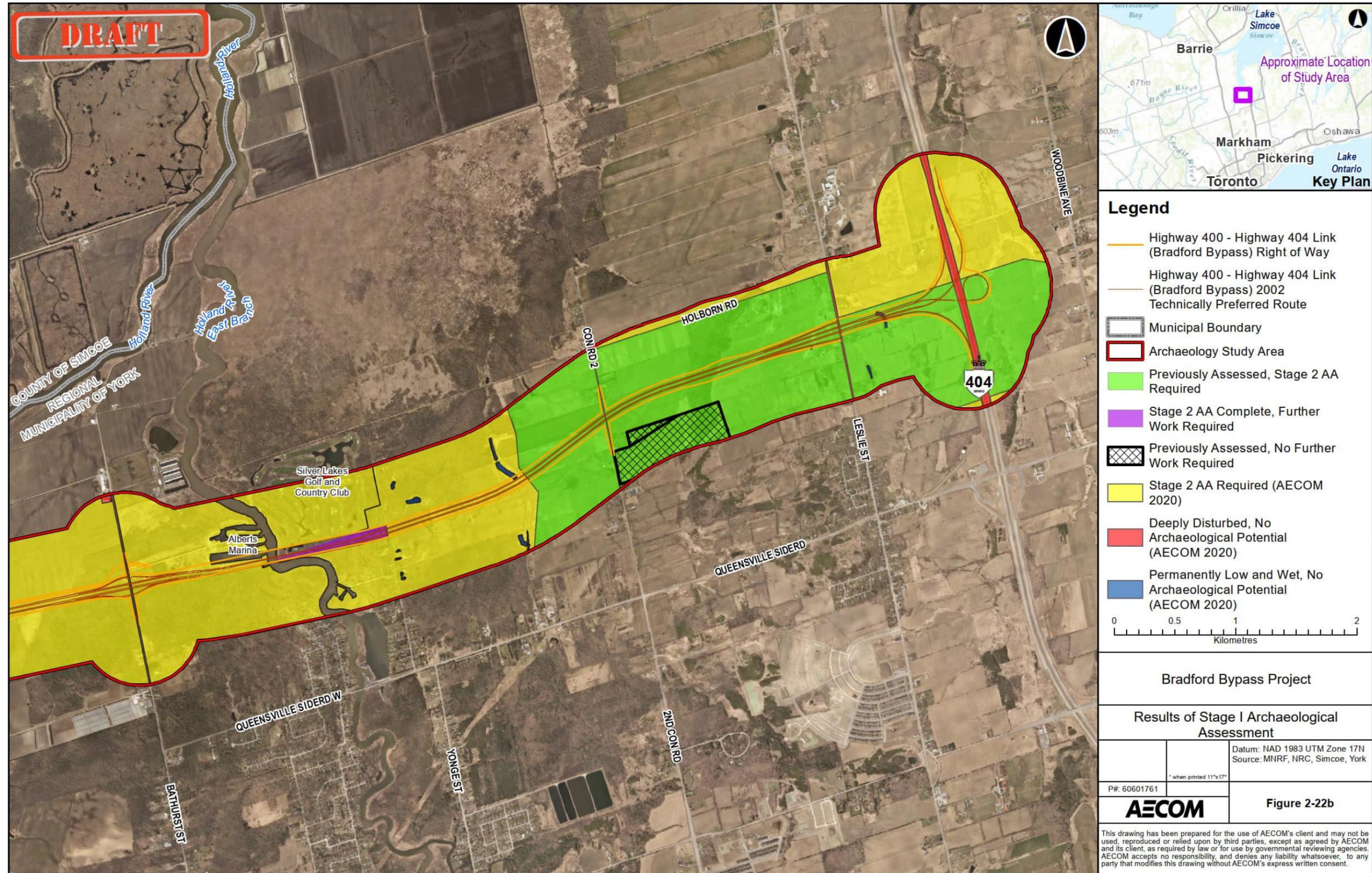


Figure 2-22b: Results of the Stage 1 Archaeological Assessment



The following five sites identified in **Table 2-37** require further Stage 2 Archaeological Assessments (**Section 2.3.1.2**):

- BaGv-42
- BaGv-82
- BaGv-83
- BaGv-95
- BaGu-137.

The East Holland River site (BaGv-42), as documented by ASI (1997) and New Directions Archaeology (2005) is found within the current Study Area. The results of these assessments indicate that this site is multi-component, with artifacts from the Middle and Late Archaic, Middle to Early Late Woodland and early historic periods which has further cultural heritage value and interest.

The H2 site (BaGv-83) and H4 site (BaGv-82) were located by URS Canada (now AECOM) in 2014 and consist of post-contact Euro-Canadian homesteads which require further Stage 3 archaeological assessment (AECOM 2018).

The Bond Head 4 site (BaGv-95) is found in the western edge of the Study Area. It was located by This Land Archaeology Inc. in 2009 during their Stage 2 pedestrian survey. The site was subject to a controlled surface collection at this time, but no further Stage 3 archaeological assessment was completed. It is recommended for further Stage 3 archaeological assessment prior to any ground disturbance (TLA 2015).

The BaGu-137 site is located within the eastern portion of the Archaeology Study Area, as noted in the site data search completed by Ministry of Citizenship and Multiculturalism (2019). However, there is no other information available on this site. Further archaeological work is required.

In addition to the aforementioned sites, there is also one cemetery (Rogers and Sutherland United Cemetery) located in the western edge of the Study Area at the Highway 400 freeway-to-freeway interchange. The further archaeological assessment will be required prior to any ground disturbance within the property boundary, or within an area immediately adjacent to the cemetery to define the limits of potentially unmarked grave shafts.

2.3.1.2 Stage 2 Archaeological Assessment

Stage 2 assessments are ongoing throughout the study area to inform the design process. Several areas throughout the corridor have been subject to Stage 2

assessments to date and potential archaeological sites requiring further Stage 3 and/or Stage 4 assessments have been identified. **Figure 2-23** provides the results of the Stage 2 Archaeological Assessments completed up to June 10, 2022. Information related to Stage 2 Archaeological Assessment completed as part of the Early Works are summarized below, with full details presented in the Final Early Works Report (March 2022) available through the Project Website.

2.3.1.2.1 Background

The background for the Stage 2 Archaeological Assessment is outlined above in **Section 2.3.1.1** as it relates to the Stage 1 Archaeological Assessment.

Included in the Early Works component for this project, Stage 2 field survey was conducted within the targeted Early Works Study Area between July 14, 2021, and December 13, 2021, and involved test pitting in keeping with Section 2.1 of the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011). The Stage 2 assessment did not result in the recovery of any new archaeological resources; however, the following two sites are located within the Archaeology Study Area limits:

- The William Robinson Jr site (BaGv-83), formerly called the H2 site as noted in **Table 2-38**.
- The Wheatfield site (BaGv-113) was found during assessment for another part of the Bradford Bypass and its 50 metre monitoring zone overlaps with the present Archaeology Study Area.

Figure 2-23a: Status of Stage 2 Archaeological Assessments Within the Study Area (June 10, 2022)

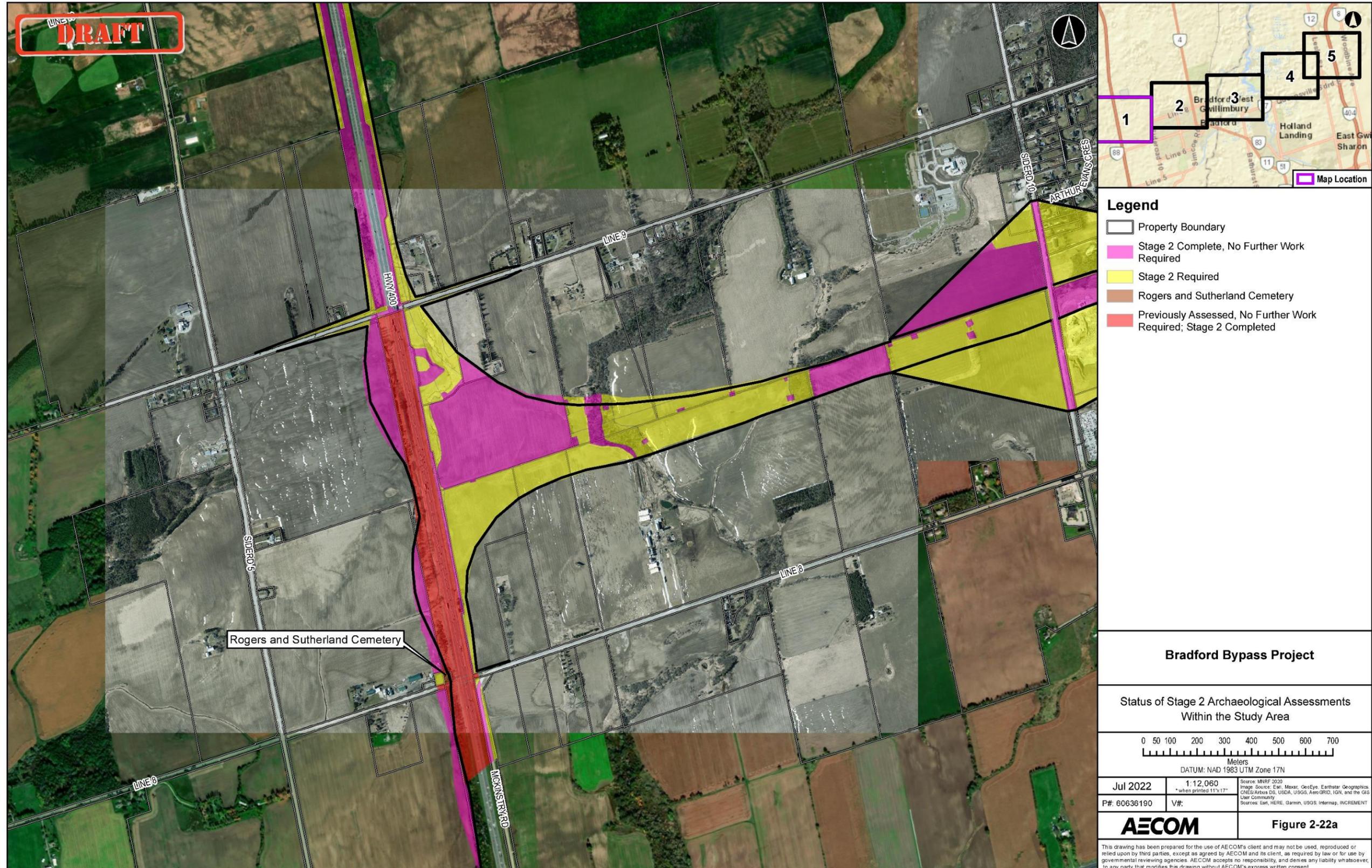


Figure 2-23b: Status of Stage 2 Archaeological Assessments Within the Study Area (June 10, 2022)

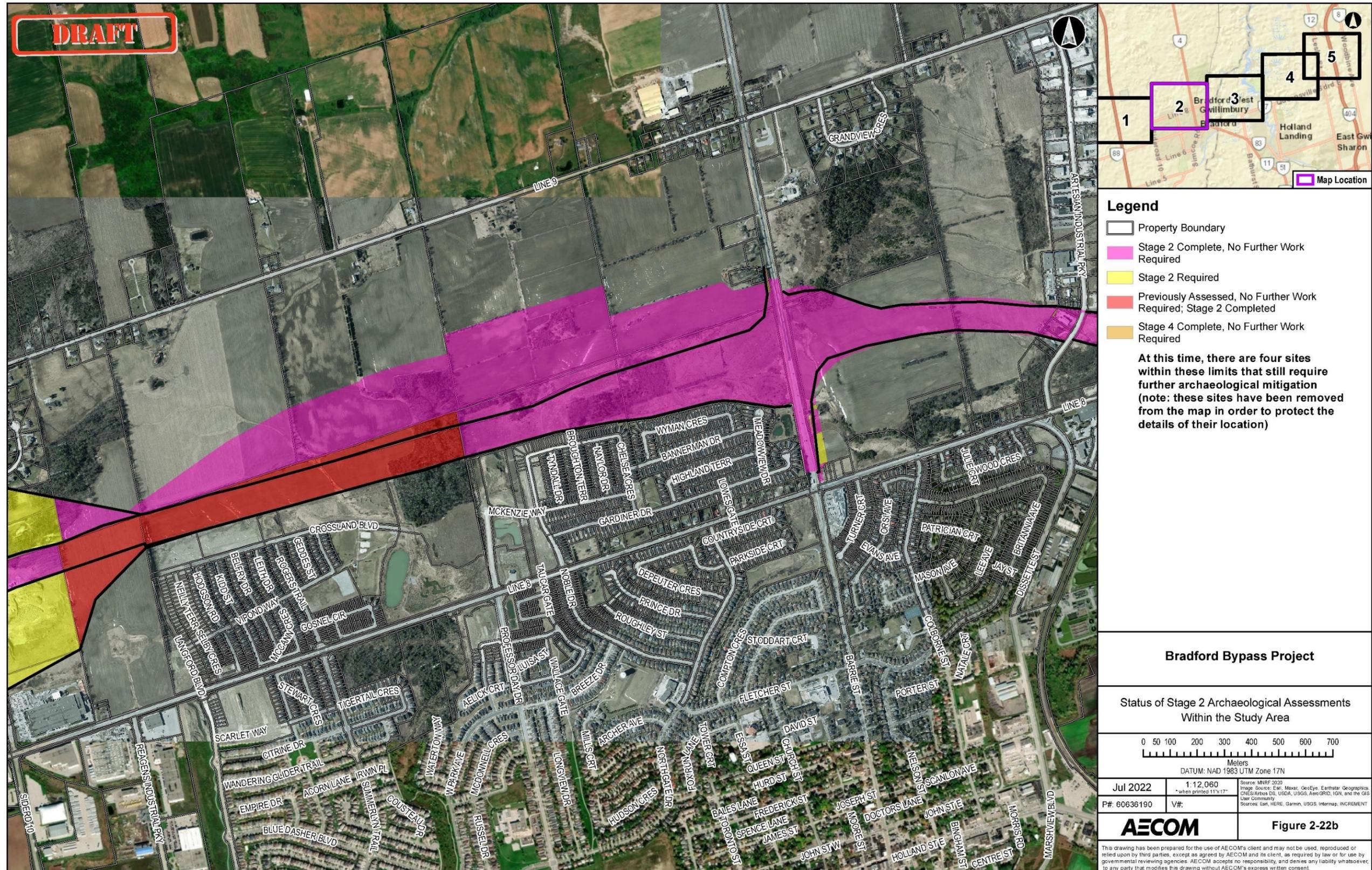


Figure 2-23c: Status of Stage 2 Archaeological Assessments Within the Study Area (June 10, 2022)

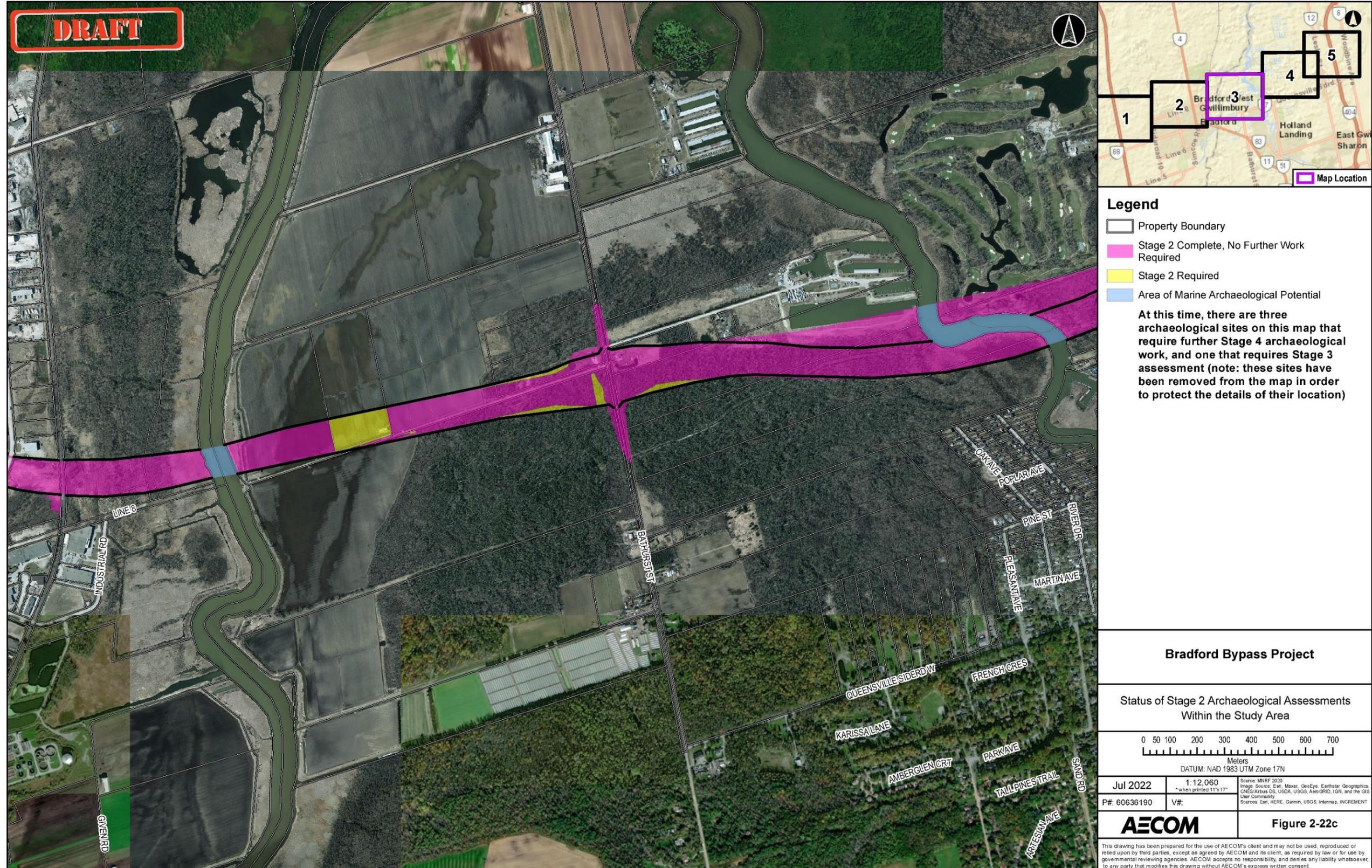


Figure 2-23d: Status of Stage 2 Archaeological Assessments Within the Study Area (June 10, 2022)

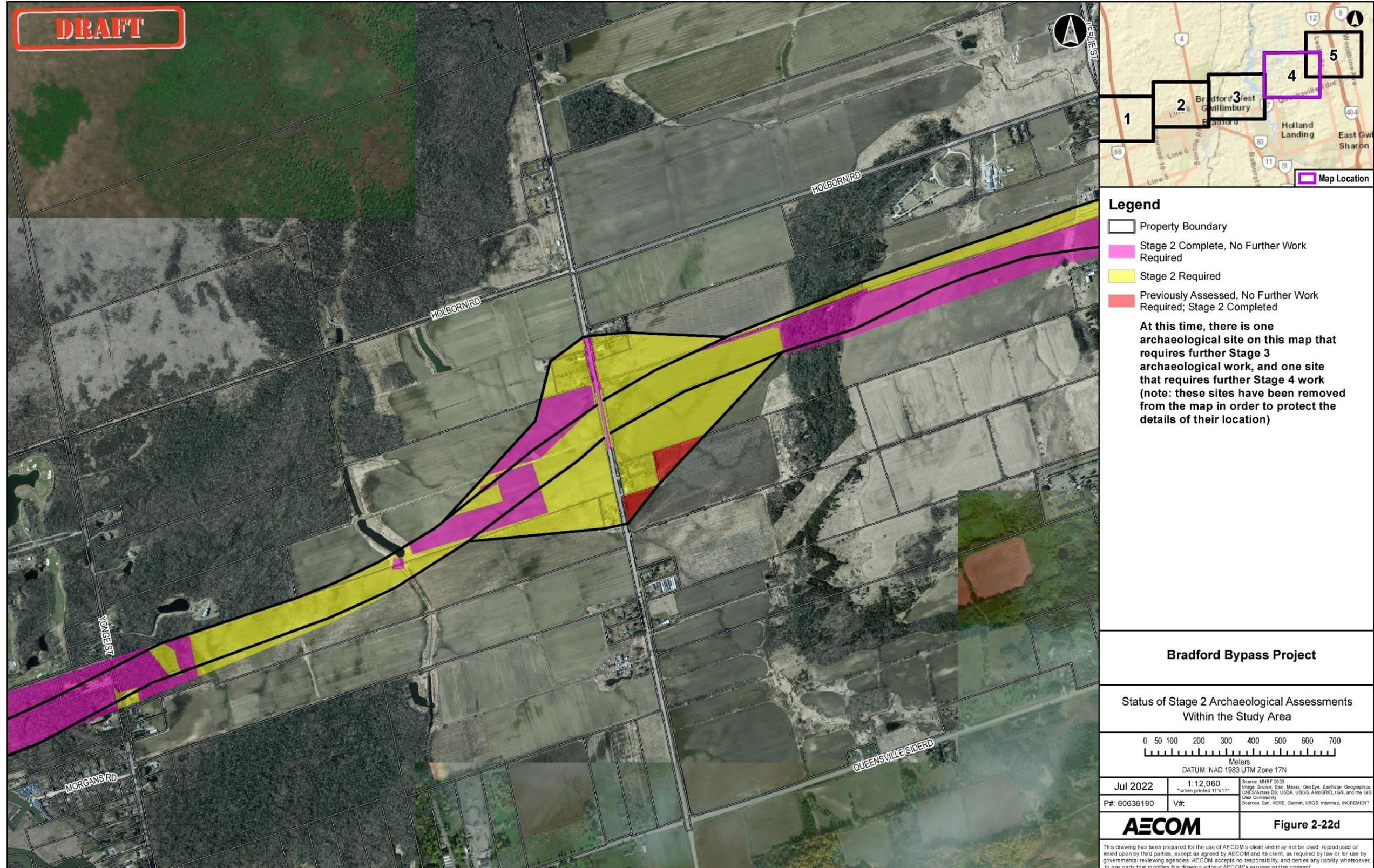


Figure 2-23e: Status of Stage 2 Archaeological Assessments Within the Study Area (June 10, 2022)

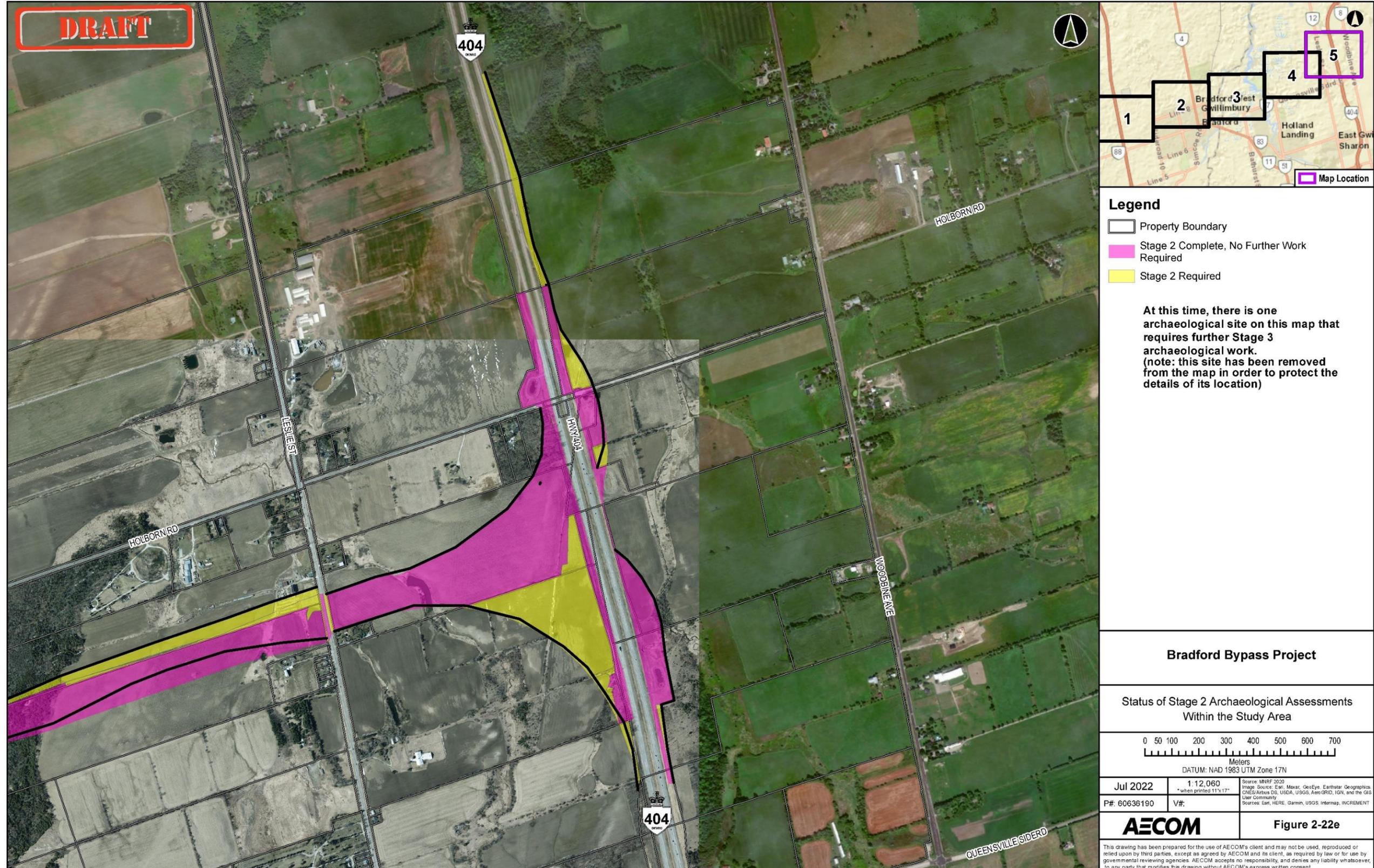


Table 2-38: Summary of Archaeological Assessment Resources Identified During Preliminary Design, Assessment Status and Recommendations for Further Work

Borden #	Site Name	Cultural Affiliation	Site Type	Cultural Heritage Value or Interest	General Location	Status / Recommendations
BaGv-83	■ William Robinson Jr Site	■ Post-Contact Euro-Canadian	■ Homestead	■ Further Cultural Heritage Value or Interest	■ Within Early Works Study Area	■ Stage 3 and Stage 4 completed Early Works ■ Stage 4 under review with Ministry of Citizenship and Multiculturalism.
BaGv-113	■ Wheatfield Site	■ Pre-Contact	■ Campsite	■ Further Cultural Heritage Value or Interest	■ Within Early Works Study Area	■ Stage 3 completed Early Works. ■ Stage 3 under review with Ministry of Citizenship and Multiculturalism ■ Stage 4 Required
BaGv-82	■ Gilbert Robinson Site	■ Post-Contact Euro-Canadian	■ Homestead	■ Further Cultural Heritage Value or Interest	■ Within study Area	■ Stage 3 under review with Ministry of Citizenship and Multiculturalism
BaGv-42	■ East Holland River	■ Post-Contact Euro-Canadian, Middle Woodland Indigenous	■ Homestead, Fishing	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Required
BuGv-137	■ Unknown	■ Unknown	■ Unknown	■ Unknown	■ Within the Study Area	■ Stage 2 Required
BaGv-112	■ Bradford Hill	■ Indigenous	■ Village	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Complete / Stage 4 Required
Pending	■ Pending Indigenous Recommendation	■ Indigenous	■ Findspot	■ No Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 complete, no further work required.
BaGv-116	■ Frazer Creek	■ Indigenous	■ Campsite	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Complete / Stage 4 Required
BaGv-115	■ Bradford Ridge	■ Indigenous	■ Findspot	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Complete / Stage 4 Required
Pending	■ Holland Forest 2 (P1)	■ Indigenous	■ Campsite	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Required
BaGv-114	■ Riverbend (P2)	■ Multi-component	■ Pending	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 underway
Pending	■ Holland Forest 1 (P3)	■ Pending	■ Pending	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Required
Pending	■ Pending	■ 19 th Century Euro-Canadian	■ Pending	■ Further Cultural Heritage Value or Interest	■ Within the Study Area	■ Stage 3 Required

2.3.1.2.2 Methodology

The objective of Stage 2 archaeological assessment is to provide an overview of archaeological resources within the Archaeology Study Area and make a determination as to whether any of the resources might be artefacts or archaeological sites with cultural heritage value or interest requiring further assessment. Based on that determination, the Stage 2 archaeological assessment will provide a recommendation for appropriate Stage 3 assessment strategies for any archaeological sites identified.

Field methods involved a variety of methods based on the properties and land uses within the corridor requiring Stage 2 archaeological assessment. This included test pit surveys and pedestrian surveys. Test pits were established in accordance with the Standards and Guidelines for Consultant Archaeologists with each test pit approximately 30 centimetres in diameter and excavation to at least 5 metres into sterile subsoil. All test pits were examined for stratigraphy, cultural features, or evidence of fill. All soil was screened through hardware mesh with an aperture of 6 millimetres to facilitate the recovery of cultural material. This material was then used to backfill the pit. Where pedestrian surveys were completed on lands including those associated with agricultural uses, the area was ploughed and allowed to weather. Surveys were completed using 5 metre transects, and if archaeological resources are found, the survey interval was decreased to 1 metre separation for at least 20 metres over any find locations.

Photographs were taken to illustrate the methods and conditions for the Stage 2 field investigations. They are included in Stage 2 archaeological assessment reports identifying the locations and directions with an illustration of the methods and results of the field investigations.

2.3.1.2.3 Existing Conditions

This section provides a current summary of findings based on the Stage 2 archaeological assessment completed up to June 10, 2022. This includes a summary of archaeological information presented as part of the County Road 4 Early Works, where it overlaps with project. **Table 2-38** provides a summary of currently identified archaeology resources within the Archaeology Study Area, along with recommendations for further work, where appropriate. These areas fall within the areas shown in **Figure 2-23**, which provide an overview of the status of archaeological investigations to date.

Stage 2 Archaeological Assessments – Early Works

The following two sites were completed and documented in the Early Works Report (March 2022).

The William Robinson Jr Site (BaGv-83)

The William Robinson Jr Site (BaGv-83) was found in 2014 during the Stage 2 archaeological assessment for the County Road 4 Widening for the County of Simcoe's Environmental Assessment (URS 2014). As part of this study, the portion of the William Robinson Jr site (BaGv-83) within the proposed widening footprint was subject to a Stage 3 archaeological assessment (AECOM 2021). The Stage 3 archaeological assessment determined that only a small portion of the site was intact with the remainder being disturbed by residential / septic construction to the west and the grading for County Road 4 to the east. The Stage 3 assessment took place on July 30, 2021. Five test units were excavated across the study area (approximately 25 metres x 3 metres wide) and produced 155 Euro-Canadian artifacts. The modest assemblage of artifacts collected from the William Robinson Jr site (BaGv-83) showed signs of debris representative of a mid to late 19th century domestic occupation based on the ceramic tableware, kitchenware, structural and personal items recovered. Additionally, a single pre-contact Indigenous ceramic sherd was found. This assemblage recovered during the Stage 2 and 3 assessments indicates the portion of the William Robinson Jr site within the current alignment must be subject to Stage 4 mitigation.

The Stage 4 archaeological assessment was conducted between October 13, 2021, and October 19, 2021. No artifacts were recovered from the trenching of the William Robinson Jr Site (BaGv-83). One feature, a post, was found. The post was approximately 27 centimetres in length, 26 centimetres in width and 73 centimetres in depth. After being recorded, the post was excavated. No artifacts were found in the post feature and AECOM recommended that the portion of the William Robinson Jr Site (BaGv-83) that has been subject to Stage 4 archaeological assessment is cleared of further archaeological work upon receiving concurrence from the Ministry of Citizenship and Multiculturalism.

The Wheatfield Site (BaGv-113)

The Wheatfield site (BaGv-113) was found during assessment for another part of the Bradford Bypass in 2021 and its 50 metres monitoring zone overlaps with the Archaeology Study Area. The site was subject to Stage 3 assessment on October 12 and 13, 2021. Eleven test units were completed, resulting in the recovery of one additional pre-contact ceramic sherd.

Upon receiving concurrence of the Stage 2, Stage 3 and Stage 4 Archaeological Assessment Reports from the Ministry of Citizenship and Multiculturalism, the following

measures shall be adhered to for lands within the Limits of Work that will be impacted by the County Road 4 Early Works:

- If the portion of the Wheatfield Site (BaGv-113) within the Study Area cannot be avoided by future development, it which will be impacted by development it must be subject to Stage 4 mitigation as outlined in Section 4.2 of the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011)
- All other areas are either disturbed, low lying and wet, steeply sloped or no archaeological resources were found. These areas are considered cleared of further archaeological work.

The remaining four sites are being incorporated into the current Stage 2 Archaeological Assessment report for the project and include the information pertaining to newly identified sites that may be identified during the assessment of the Study Area. Once all Stage 2 Archaeological works are completed, the report will be submitted to the Ministry of Citizenship and Multiculturalism for review and concurrence.

Stage 2 Archaeological Assessment – Bradford Bypass

A summary of the initial findings of the Stage 2 archaeological assessments completed to date, within the Study Area are presented in **Table 2-38** along with recommendations or status for further work. The current status of Stage 2 archaeological assessment studies during Preliminary Design are shown in **Figure 2-23**.

In addition to the sites identified in **Table 2-38**, the cemetery (Rogers United and Sutherland Cemetery) located on the west side of Highway 400 within the area of the freeway-to-freeway interchange ramps for Bradford Bypass and Highway 400 will be assessed to determine the presence of outlying unmarked grave shafts, which may be present beyond the property limits. This will involve a strategy of test pitting and stripping within a 10 metre area. This work will be carried out as a Stage 3 archaeological assessment in accordance with Standard and Guidelines for Consultant Archaeologists.

The status of archaeological assessments being carried out during this Preliminary Design are presented in **Figure 2-23**. Completed work includes areas where Stage 2 has been completed as part of this study or completed by others, or as part of the Early Works component (including Stage 4) and no further work is required. Remaining Stage 2 work will involve completion of pedestrian surveys or test pit surveys. Where Stage 2 work has been completed, future Stage 3 will be carried out to satisfy the Regulation. In select areas where Stage 3 assessment has already been completed, location is identified for Stage 4 mitigation if the archaeological resource site cannot be fully avoided.

2.3.2 Built Heritage Resources and Cultural Heritage Landscapes

The cultural heritage study was prepared to identify all potential Built Heritage Resources and Cultural Heritage Landscapes located within the Built Heritage Resources and Cultural Heritage Landscape Study Area for the Ministry's undertaking. It includes a preliminary assessment of the potential impacts from proposed project activities and recommendations on mitigations to conserve potential cultural heritage resources within the Built Heritage Resources and Cultural Heritage Landscape Study Area.

As part of the preparatory work for the Preliminary Design, an initial Cultural Heritage Resource Assessment Report was prepared (2020). As part of this Preliminary Design phase, the report was reviewed by the Ministry of Citizenship and Multiculturalism and the Project Team has undertaken an update to the Cultural Heritage Resource Assessment Report to reflect the existing conditions and potential impacts within the Study Area to inform project planning. The updated report identifies and assesses potential impacts to the Built Heritage Resources and Cultural Heritage Landscapes from the proposed project design and recommends investigations and initial mitigation strategies and next steps where there is potential for adverse impacts. Where further investigations are recommended, cultural heritage evaluations of properties will be completed to evaluate cultural heritage value or interest and documented in a stand-alone Cultural Heritage Evaluation Report for each individual resource.

The following sections outline the background, data collection and assessment of existing cultural heritage conditions within the Built Heritage Resources and Cultural Heritage Landscape Study Area.

2.3.2.1 Background

The 2002 Approved Environmental Assessment included a high-level assessment of built heritage resources and cultural heritage landscapes within the Study Area through identification of known or potential cultural heritage resources within, or immediately adjacent to, the Study Area. The assessment was used to support recommendations regarding further evaluation of properties for cultural heritage value or interest as well as assessment of potential impacts and development of mitigation strategies.

As part of the preparatory work for the re-initiation of the Bradford Bypass in 2020, AECOM conducted a Cultural Heritage Resource Assessment Report (AECOM, 2020), which provided a desktop assessment of existing known and potential built heritage resources and cultural heritage landscapes within the Study Area, which includes:

- Two Built Heritage Resource have been Designated under Part IV of the Ontario Heritage Act

- Fourteen resources (three Built Heritage Resources and 11 Cultural Heritage Landscapes) have been Listed on the municipal heritage registers of the municipalities within the Study Area
- A further eight resources (five Built Heritage Resources and three Cultural Heritage Landscapes) were identified by AECOM during the desktop review process. These properties have no formal heritage recognition but have the potential for Cultural Heritage Value or Interest pending more detailed evaluation.

Since the completion of the 2002 Approved Environmental Assessment and the 2020 Preliminary Design preparatory work, several changes have occurred associated with Built Heritage Resources and Cultural Heritage Landscapes. As such, an update to the description of the environmental conditions within the Built Heritage Resources and Cultural Heritage Landscapes Study Area is included in the following sections below.

2.3.2.2 Data Collection

The revised Cultural Heritage Resource Assessment Report was prepared according to the requirements of the Standards and Guidelines for Conservation of Provincial Heritage Properties and the Ministry's cultural heritage conservation policy and procedures as outlined in the Ontario Heritage Bridge Guidelines and the Environmental Guide for Built Heritage and Cultural Heritage Landscapes and in accordance with the Terms of Reference for the revised Cultural Heritage Resource Assessment Report provided to AECOM by the Ministry for the project. The Cultural Heritage Resource Assessment Report was also prepared with reference to Ministry of Citizenship and Multiculturalism's Ontario Heritage Tool Kit (2006). Based on the Cultural Heritage Resource Assessment Report requirements, the following steps were taken to prepare the report:

- A review of municipal, provincial, and federal heritage registers and inventories, including:
 - Bradford West Gwillimbury Municipal Heritage Register (updated: 2020)
 - Township of King Municipal Heritage Register (updated: N/A)
 - Town of East Gwillimbury: Register of Properties of Cultural Heritage Value or Interest (updated: June 2021).
- Review of appropriate background documents including:
 - Environmental Assessment Report One-Stage Submission: Highway 400-Highway 404 Extension Link (Bradford Bypass). W.P. 377-90-00 (McCormick Rankin Corporation, December 2002)

- (Desktop) Cultural Heritage Resource Assessment Report – Final: Built Heritage Resources & Cultural Heritage Landscapes (AECOM, February 2020)
- Stage 1 Archaeological Assessment – Highway 400 – Highway 404 Link (Bradford Bypass) DRAFT (February 2020)
- Heritage Register Review: Town of East Gwillimbury, Ontario (ASI 2021)
- Marine Archaeological Assessment Holland River East Adjacent to Lot 118, Concession 1, West of Yonge St. Town of East Gwillimbury Regional Municipality Revised Report (January 2022).
- In April 2022, AECOM contacted heritage planning staff at the Town of Bradford West Gwillimbury, Town of East Gwillimbury, and the Township of King.
- A review of available online historic mapping;
 - 1860 Tremaine’s Map of the County of York, Canada West
 - Hogg’s Map of the County of Simcoe, 1871
 - 1878 Illustrated Historical Atlas of the County of York
 - 1881 Illustrated Historical Atlas of the County of Simcoe
 - 1928 National Topographic Series map (Alliston sheet)
 - 1929 National Topographic Series map (Newmarket Sheet).
- The refined Built Heritage Resource and Cultural Heritage Landscape Study Area was screened for Built Heritage Resources and Cultural Heritage Landscapes through the review of the following online searchable databases including:
 - Ontario Heritage Trust Conservation Easements
 - Ontario Heritage Trust’s Places of Worship Inventory
 - Ontario Heritage Trust’s Provincial Plaque Program
 - Ontario Heritage Trust’s Ontario Heritage Act Register
 - Ontario Historical Society’s Ontario Heritage Directory and Map
 - Ontario Genealogical Society’s Ontario Cemetery Index
 - Parks Canada’s National Historic Sites
 - Parks Canada’s The Canadian Register of Historic Places on Canada’s Historic Places website
 - Parks Canada’s Directory of Federal Heritage Designations
 - Canadian Heritage River System website
 - United Nations Educational, Scientific and Cultural Organization World Heritage Sites.

A field review on April 7, 2022 was conducted during this Preliminary Design to document the existing conditions, confirm, and identify potential Built Heritage Resources and Cultural Heritage Landscapes within the refined Built Heritage Resources and Cultural Heritage Landscape Study Area from publicly accessible rights-of-way. Physical descriptions of potential Built Heritage Resources and Cultural Heritage Landscapes were prepared based on visibility from the nearest right-of-way.

2.3.2.3 Description of Environmental Conditions

Sixteen properties with potential cultural heritage value or interest were identified within the Built Heritage Resources and Cultural Heritage Landscape Study Area as summarized below:

- Four Built Heritage Resources - BHR 2, BHR 3, BHR 5, and BHR 8,
- Twelve Cultural Heritage Landscapes - CHL 1, CHL 3, CHL 4, CHL 6, CHL 7, CHL 8, CHL 9, CHL 13, CHL 14, CHL 15, CHL 16, and CHL 17.

2.3.2.4 Preliminary Impact Assessment.

A preliminary impact assessment of potential adverse impacts from the project was completed based on Ministry of Citizenship and Multiculturalism Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties, 2017 to assess potential property-specific impacts to potential Built Heritage Resources and Cultural Heritage Landscapes within the refined Built Heritage Resources and Cultural Heritage Landscape Study Area. Recommendations were provided for mitigations and next steps to ensure conservation of cultural heritage resources during the highway design process.

Built Heritage Resources and Cultural Heritage Landscapes that may be directly and indirectly adversely impacted and have been mapped on **Figure 2-24**.

Three Ministry of Transportation related structures were identified within the Built Heritage Resource and Cultural Heritage Landscapes Study Area and were screened for potential Cultural Heritage Value or Interest.

Table 2-39 below summarizes the structures within the Built Heritage Resource and Cultural Heritage Landscapes Study Area.

These three structures were screened out by the Ministry's engineers for this project. None were identified as having Cultural Heritage Value or Interest. Therefore, none of the structures within the Built Heritage Resource and Cultural Heritage Landscapes Study Area will require further documentation or heritage assessments.

Figure 2-24: Potential Built Heritage Resources and Cultural Heritage Landscapes Within the Built Heritage Resource and Cultural Heritage Landscape Study Area

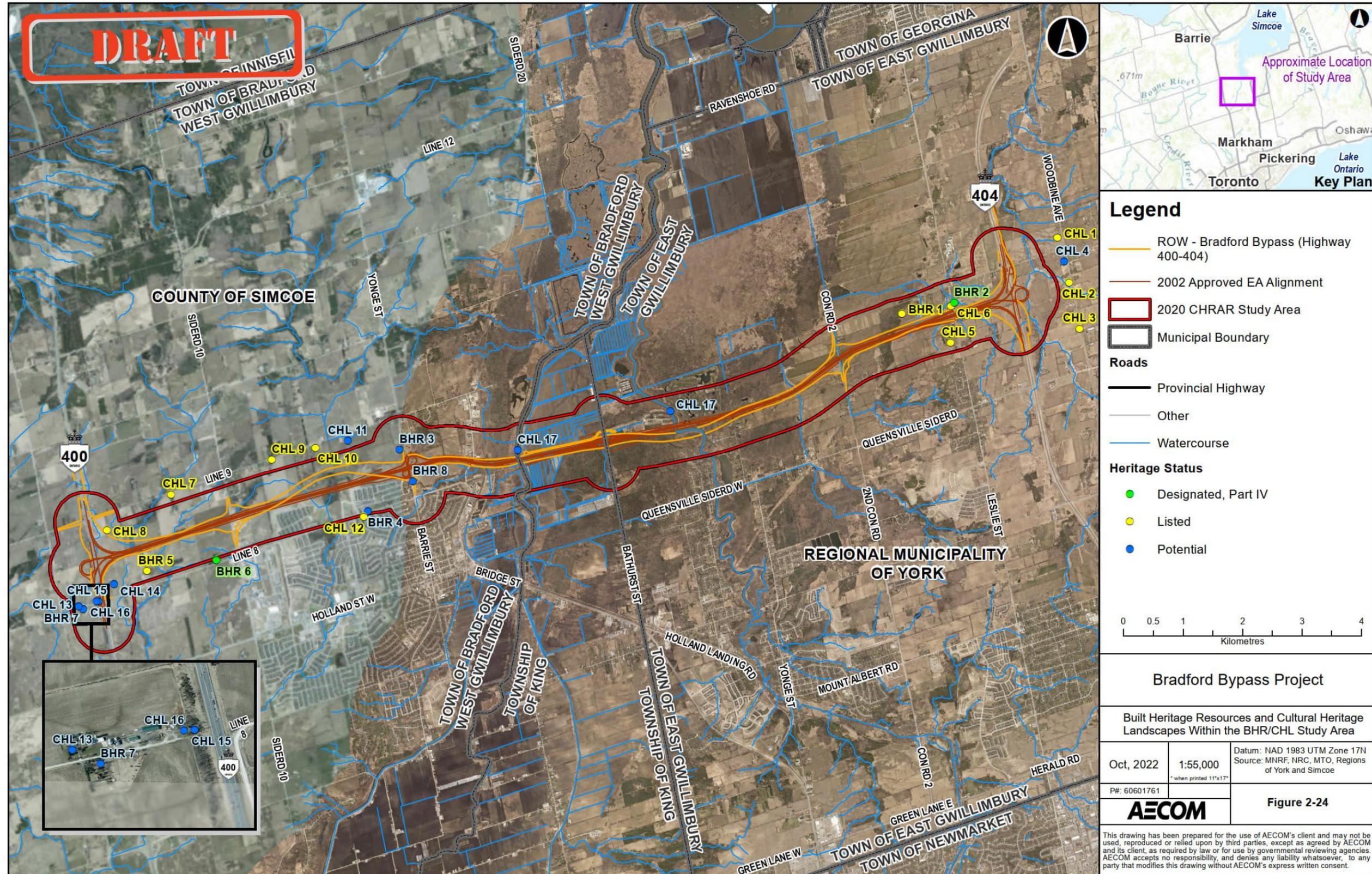


Table 2-39: Summary of Structures Within the Built Heritage Resource and Cultural Heritage Landscapes Study Area

Ministry of Transportation Site No.	Structure	Construction Date	Structure Category	Heritage Status
30 – 308/1	■ Town of Bradford West Gwillimbury 9 th Line Overpass – Northbound Lanes	1951	Bridge	■ Ministry’s Regional Structural Section identified this structure as having low potential for Cultural Heritage Value or Interest.
30 – 308/2	■ Town of Bradford West Gwillimbury 9 th Line Overpass – South Bound Lanes	1951	Bridge	■ Ministry’s Regional Structural Section identified this structure as having low potential for Cultural Heritage Value or Interest.
30 – 566/C	■ Hwy 400 - Pennville Creek Culvert	1953	Culvert	■ Previously documented in the Ministry of Transportation Heritage Screening Report for Structure Culverts as not requiring a further assessment.

2.4 Engineering Studies

In addition to the environmental studies described in **Section 2.1**, **Section 2.2** and **Section 2.3**, engineering studies are being carried out to document and assess existing conditions and design features, outline the preliminary description of potential impacts of the project, outline a description of potential measures to mitigate those impacts and identify applicable municipal, provincial, federal or other regulatory approvals or permits associated with design and engineering that may be required for the project.

Engineering studies will be detailed in discipline-specific existing condition and impact assessment reports to be completed during the Preliminary Design. The sections below summarize the study methodologies and describe the existing conditions, for the following engineering disciplines:

- Traffic and Transportation
- Geotechnical
- Utilities.

2.4.1 Traffic and Transportation

A traffic and transportation model was developed to assess the existing traffic conditions for the traffic network within the Study Area. The following sections outline the traffic model development, data collection and describe the existing traffic operations within the Study Area.

2.4.1.1 Data Collection

A traffic microsimulation model was developed in 2020 using the Aimsun Next 20 software package provided by the Ministry. The model matched all real-world lane configurations, intersection controls, speed limits, signal timing plans, priority rules and other elements from the Highway 400 corridor south of Simcoe County Road 88 to north of Highway 89, as well as the Highway 404 corridor south of Green Lane East to its terminal at Woodbine Avenue; and includes all mainline sections and associated ramps and ramp terminal intersections at arterial roads and freeway to freeway ramps. The model will be used for future project design development analysis.

The traffic microsimulation model was developed by review of available information, including a review of historical Annual Average Daily Traffic on Highway 400 for the sections within the Study Area, raw traffic count data provided by the Ministry for Highway 404, and speed and travel time data for Highway 400 and Highway 404. Traffic volumes were balanced after applying growth projections to develop the base year existing conditions volumes. Pre-pandemic traffic volumes were used to represent

typical peak hour volumes to avoid reflecting the impact of the COVID-19 pandemic on traffic within the Study Area.

2.4.1.2 Description of Existing Conditions

An overview of the existing road intersections located within the Study Area is provided in **Table 2-40** below. All intersections are signalized except at the Queensville Sideroad and Highway 404 West Ramp Terminal, and Woodbine Avenue and Highway 404 North Ramp Terminal.

Table 2-40: Existing Road Network Within the Study Area

Intersection	Jurisdiction
Simcoe County Road 88 and 5th Sideroad	Bradford West Gwillimbury
Simcoe County Road 88 and Highway 400 West Ramp Terminal	Ministry of Transportation
Simcoe County Road 88 and Highway 400 East Ramp Terminal	Ministry of Transportation
Highway 89 and 5 th Side Road	Ministry of Transportation
Highway 89 and Highway 400 West Ramp Terminal	Ministry of Transportation
Highway 89 and Highway 400 East Ramp Terminal/Rieve Boulevard	Ministry of Transportation
Green Lane East and Leslie Street	York Region
Green Lane East and Highway 404 West Ramp Terminal	Ministry of Transportation
Green Lane East and Highway 404 East Ramp Terminal	Ministry of Transportation
Green Lane East/Herald Road and Woodbine Avenue	York Region
Queensville Sideroad and Leslie Street	York Region
Queensville Sideroad and Highway 404 West Ramp Terminal	Ministry of Transportation
Queensville Sideroad and Highway 404 East Ramp Terminal	Ministry of Transportation
Queensville Sideroad and Woodbine Avenue	York Region
Woodbine Avenue and Ravenshoe Road	York Region
Woodbine Avenue and Highway 404 North Ramp Terminal	Ministry of Transportation
Woodbine Avenue and Highway 404 South Ramp Terminal	Ministry of Transportation

The traffic microsimulation model analysis revealed eight critical movements during the AM peak hour, summarized below:

- Simcoe County Road 88 and Highway 400 West Ramp Terminal – Westbound left and southbound left
- Woodbine Avenue and Ravenshoe Road – Eastbound and northbound left
- Green Lane East and Leslie Street – Northbound and southbound
- Green Lane East and Harry Walker Parkway North – Westbound left, and
- Green Lane East and Woodbine Avenue – Left northbound.

The traffic simulation model analysis revealed 14 critical movements during the PM peak hour, summarized below:

- Highway 89 and Highway 400 East Ramp Terminal / Rieve Boulevard – Southbound
- Simcoe County Road 88 and Highway 400 West Ramp Terminal – Northbound left and southbound left
- Woodbine Avenue and Ravenshoe Road – Eastbound, eastbound left, northbound left, and westbound
- Woodbine Avenue and Highway 404 South Ramp Terminal – Westbound right and southbound left
- Queensville Sideroad and Leslie Street – Eastbound left
- Green Lane East and Leslie Street – Northbound, northbound left and southbound; and
- Green Lane East and Highway 404 West Ramp Terminal – Southbound right.

The majority of movements were shown to operate at acceptable levels during both peak hours. Traffic operations at intersections throughout the Study Area are shown to operate at mostly acceptable levels. Given the close replication of actual operating conditions, the weekday AM, and PM peak period models are deemed to be acceptable for use in assessing future design alternatives and construction staging scenarios.

2.4.2 Geotechnical

Geotechnical studies are continuing to be undertaken to evaluate the subsurface conditions and provide foundations and pavement engineering recommendations for the project. The following sections outline the background, data collection and describe the existing environmental conditions within the Study Area. Additional information will be provided in the Environmental Impact Assessment Report, under separate cover.

2.4.2.1 Data Collection

Geotechnical field investigations for the project were carried out from July to November 2021, and included a pavement condition survey, borehole investigation, material sampling, and a pavement coring program. The purpose of the geotechnical investigation was to advance drilling of boreholes. The boreholes were advanced in accordance with Ministry of Transportation's Provincial Pavement Engineering Investigations Guidelines (June 2013). Sixty-five samples of granular and soil types were obtained from the boreholes and sent for laboratory testing in accordance with the Ministry of Transportation's Laboratory Testing Manual (May 2021).

Updated geotechnical and borehole investigations are currently ongoing and the results will be summarized in the Environmental Impact Assessment Report, under separate cover.

2.4.2.2 Description of Environmental Conditions

Generally, the subgrade soils encountered within the Study Area have low susceptibility to frost heaving. Based on the profiles available at this time, the locations of moderate and high frost susceptible soils are within deep cut/fill sections. The regional geological conditions within the Study Area are discussed in **Section 2.1.4.3**.

The surficial soils in the Schomberg Clay Plains consist primarily of varved clay and silt deposits. These varved deposits overlie till with drumlins as found in the Peterborough Drumlin Field. The drumlins (glacially-shaped hills) are completely or partially buried by the clay and silt deposits, depending on the size of the drumlin. The varved clay and silt deposits are typically about 5 metres thick, although deeper deposits have been found in some locations.

The surficial soils in the Peterborough Drumlin Field, in which the Ninth Concession site is located, consist primarily of gravelly sand till or sand and gravel deposits. Deposits of silt, clay or peat may be found in the low-lying areas between drumlins.

Along Highway 400, the Simcoe Lowlands include the Holland River valley, the shores of Kempenfelt Bay, the Nottawasaga River, and Innisfil Creek. The Holland River valley at the southern end of this project extends southwest from Cook Bay, at the south end of Lake Simcoe; it was once a shallow extension of the lake. The floor of the valley is covered by extensive deposits of loose silts and soft clays, which overlie a till sheet. In localized areas, these silts and clays are overlain by a thin, poorly graded sand of deltaic origin. Because the valley is depressed and poorly drained, a surficial cover of peat has formed in many areas. The surficial soils of the northern lobe of the Simcoe Lowlands consist primarily of sand, although silt, clay or peat may be found in low-lying areas.

A majority of the soil samples recovered were in moist condition. Wet conditions and free water were encountered locally in boreholes along the proposed alignment of the Bradford Bypass and ramps, and along Highway 400. It should be recognized that the free water depth should not strictly be inferred as the local water table depth. This observation refers to the water seepage conditions in the boreholes at the time of augering and is highly influenced by the prevailing weather conditions. The local groundwater levels will be higher in the Spring and during wet periods.

The pavement design alternatives considered for the project included a “flexible” and a “rigid” design. A 50-year Life Cycle Cost Analysis was carried out for the project in accordance with Ministry of Transportation’s Guidelines for the Use of Life Cycle Cost Analysis on Ministry of Transportation Freeways (March 2003).

2.4.3 Utilities

Within the Study Area, Preliminary Design considerations for existing utilities that occur within, or may cross the Technically Preferred Route have been identified. Ongoing engineering design and consultation is being carried out to understand design interactions, recommendations for refinements or utility relocations. Utilities include both private and public utilities, as outlined below.

2.4.3.1 Private Utilities

Table 2-41 lists the privately-owned utility providers with infrastructure within the Study Area. A refined list of utilities will be confirmed as the Preliminary Design phase progresses, and include design recommendations and outcomes of consultation with service providers.

Table 2-41: Private Utilities Within the Study Area

Utility Provider	Utility Category
Alectra Utilities	Energy
Bell Canada	Communications
Enbridge Inc.	Natural Gas
Hydro One Networks Inc. Transmission	Energy
Hydro One Networks Inc. Distribution	Energy
Rogers Communications	Communications
ViaNet	Communications
Zayo	Communications

2.4.3.2 Public Utilities

Table 2-42 lists the public utility providers with infrastructure within the Study Area. A refined list of utilities will be confirmed as the Preliminary Design phase progresses, and include design recommendations and outcomes of consultation with service providers.

Table 2-42: Public Utilities Within the Study Area

Utility Provider	Utility Category
Simcoe County	Water, Stormwater, Traffic Signals, Illumination
York Region	Water, Stormwater, Traffic Signals, Illumination, Fibre Communications
Town of Bradford West Gwillimbury	Water, Stormwater, Traffic Signals, Illumination
Town of East Gwillimbury	Water, Stormwater, Traffic Signals, Illumination
Township of King	Water, Stormwater

3. Related Studies

This section describes any related studies that the project is considering in accordance with Section 16(3)(b) of the Regulation.

3.1 Simcoe County Road 88 Interchange Improvements

The Ministry has retained Stantec Consulting Ltd. (Stantec) to complete the Detail Design and Class Environmental Assessment for Highway 400 Improvements for three structures and one culvert in the Town of Bradford West Gwillimbury. The work has been divided into three projects including the following:

- Project 1 (G.W.P. 2331-16-00)
 - Replacement of the Simcoe Road 88 Underpass (MTO Site No. 30-309)
 - Reconstruction of the Highway 400 / Simcoe Road 88 Interchange
 - Realignment of McKinstry Road
 - Relocation of the Simcoe Road 88 Carpool Lot
- Project 2 (G.W.P. 2190-20-00)
- Replacement of the Line 9 Overpasses (northbound lanes and southbound lanes (Ministry of Transportation Site No. 30-308/1&2)).
- Project 3 (G.W.P. 2077-18-00)
 - Rehabilitation of Line 13 Overpasses (northbound and southbound lanes (Ministry of Transportation Site No. 30-351/1&2)
 - Rehabilitation of Line 12 Structural Culvert (Ministry of Transportation Site No. 30-567/C).

3.2 Simcoe County Road 4 Widening

The County prepared an Environmental Study Report (2012) for the widening of County Road 4 from north of 8th Line to north of County Road 89 that was approved under the Municipal Class Environmental Assessment process. The approved plan provides a four-lane rural road cross-section, including a flush 1.0 metre paved median. The approved plan includes any necessary upgrades to existing drainage systems, addition of turning lanes at various side road intersections, replacement of culverts, addition of illumination at sideroad intersections, roadside safety upgrades, correction of vertical alignment deficiencies, and inclusion of a multi-use path on the east side of County Road 4 (County of Simcoe, 2012). The County has since started site preparation works for the widening of County Road 4 from the southern limit, from 8th Line to 11th Line. The Project Team continues to co-ordinate with County of Simcoe regarding the County Road 4 and how it relates to the overall project.

4. Consultation Process

In accordance with Section 16 (8) and Section 18 of the Regulation, this section of the Report summarizes the consultation plan and consultation efforts undertaken to date for Bradford Bypass since 2020. A Record of Consultation is provided in **Appendix B** of this Report and includes detailed correspondence records, feedback, and comments received up to May 31 2022. Correspondence with Indigenous communities, stakeholders and the public received after May 31, 2022 will be documented in the Environmental Impact Assessment Report, a future report to be prepared under separate cover.

4.1 Overview of Consultation and Engagement Process

Consultation and engagement is an integral part of the study process and is essential to the successful completion of a project. Consultation for the project is required under the Regulation Consultation must be inclusive and timely in its approach to make sure stakeholders are engaged and actively participating Consultation and engagement also provides an opportunity for two-way communication between the Project Team and interested persons. Consultation activities provide a forum to identify potentially significant environmental issues early in the decision-making process and gives them appropriate consideration.

To facilitate a comprehensive consultation program for this project, the Project Team implemented the following engagement and consultation activities to reach Indigenous communities, public stakeholders, municipalities, and government agencies and provide them the opportunity to submit comments and feedback for consideration by the Project Team:

- Project Website (www.bradfordbypass.ca)
- Project Telephone Line (1-877-247-6036)
- Project Contact List
- Emails via the Project Team email address (ProjectTeam@bradfordbypass.ca)
- Mailings/notifications (via physical mail or email)
- Newspaper advertisements
- Distributions of brochure notifications (copy of the Ontario Government Notice) through Canada Post Neighbourhood Mail to residences and businesses within 500 metres of the entire Bradford Bypass Study Area (approximately 13,500 notices at the time of Study Commencement in September 2020)

- Public Information Centre (held virtually in April and May 2021 as a result of government restrictions)
- Preliminary Design Interchange Consultation Event (held virtually between April and May 2022)
- Outreach regarding engagement and consultation with Indigenous communities, further outlined in **Section 4.4**
- Meetings and correspondence with municipalities
- Correspondence with technical stakeholders, local community groups and property owners.

As a result of the public health measures linked to COVID-19 in 2020, 2021 and 2022 that restricted large in-person gatherings, the Project Team has held consultation events (e.g., meetings with technical stakeholders and a Public Information Centre) virtually by leveraging various platforms (i.e., Microsoft Teams/Skype/the Project Website). Virtual consultation events often include extended opportunities to view materials online, comment periods to provide feedback to the Project Team and opportunities to request one-on-one meetings with the Project Team. Virtual events provide flexibility for those wishing to attend who may have conflicts or restrictions that limit their ability to attend an event in person (e.g., childcare needs, work requirements, transportation etc.). Within the virtual platform there is an opportunity to also address accessibility needs as they arise.

4.1.1 Record of Consultation

The Project Team maintained a Record of Consultation related to the project through the finalization of this Environmental Conditions Report. The Record of Consultation includes the following:

- Notification materials distributed throughout the study
- Contact List
- Presentation materials
- Project Website materials
- Public Information Centre materials and Summary Reports
- Record of Consultation and correspondence with external agencies (including provincial ministries and agencies, federal departments and local conservation authorities), municipalities, Indigenous communities and members of the public.

The Record of Consultation is provided in **Appendix B** of this Report. All comments received from the public have been redacted to protect personal information in accordance with the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c. F.31.

4.2 Project Notices

Table 4-1 provides an overview of the notices and letters that were prepared and distributed as part of the project. Copies of all notices and letters are provided in **Appendix B** of this Report.

4.2.1 Permission to Enter

As part of the preparatory works in advance of the Preliminary Design study for this project, Permission to Enter was sought for properties where field investigations were deemed required. Properties were identified and contact information for the property owners was gathered through a combination of data collected from property ownership and land registry databases by the Ministry. Through a search of property fabric information and available contact details, the identified property owners were contacted by the Project Team to seek Permission to Enter in order to gain access to undertake project specific site investigations. The following contact methods were utilized as required to solicit Permission to Enter from property owners, in order of precedence:

- Emails were sent to property owners using email addresses identified by the Ministry
- Physical letters along with permission to enter forms were sent to property owners using mailing addresses identified by Ministry
- Phone calls were made using telephone numbers identified by Ministry
- Internet searches (e.g., Google, Canada Post, Canada411.com) were undertaken to find missing contact information (mailing addresses, email addresses, telephone numbers) and above listed contact methods were also utilized with the new information
- Municipalities were consulted to obtain revised/updated contact information (e.g., mailing addresses, email addresses, telephone numbers) and above listed contact methods were utilized with the new information
- Hand-delivered letters and Permission to Enter forms were distributed by Project Team members in accordance with government restrictions and relevant health and safety plans to properties with physical structures who had not responded to previous contact attempts.

A copy of the permission to enter form is provided in **Appendix B** of this Report.

Table 4-1: Summary of Project Notices and Letters

Notice	Date of Notice	Number of Notices Distributed	Distribution Method
Notice of Study Commencement	■ September 24, 2020	■ 13,500	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on the Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Notice of Public Information Centre #1	■ April 13, 2021	■ 12,459	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on the Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Notice of Publication of Draft Early Works Report	■ January 7, 2022	■ 9,887	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on the Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Notice of Publication of Final Early Works Report	■ March 21, 2022	■ 9,887	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on the Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Notice of Consultation: Preliminary Design Interchange Considerations	■ April 14, 2022	■ 10,246	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on the Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Notice of Publication of Draft Environmental Conditions Report	■ July 28, 2022	■ 10,246	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery
Revised Notice of Publication of Draft Environmental Conditions Report	■ August 12, 2022	■ 10,246	<ul style="list-style-type: none"> ■ Letters sent via email to those on Project Contact List on August 12, 2022, followed by letters sent via Canada Post, including Canada Post Neighbourhood Admail Delivery.
Notice of Publication of Final Environmental Conditions Report	■ October 27, 2022	■ 13,015	<ul style="list-style-type: none"> ■ Newspaper ads (Bradford West Gwillimbury Topic and East Gwillimbury Express) ■ Letters sent to those on Project Contact List via email and mail ■ Canada Post Neighbourhood Admail Delivery

4.2.2 Project Update Letters

The Ministry of Transportation provided a letter to all municipalities in the Study Area on October 27, 2021 with information on the implementation of the Regulation. The letters provided an overview of the Regulation along with the Early Works assessment process.

A copy of the project update letters is provided in **Appendix B** of this Report.

4.3 Consultation Plans

4.3.1 Bradford Bypass Consultation Plan

A Consultation Plan (AECOM, 2021) was developed to document the communication strategies and details for the project, including the consultation methods, communication objectives, feedback, and documentation mechanisms. The Consultation Plan enlightens stakeholders about the project and informs the Project Team about stakeholder interests and concerns so they can be resolved in a timely manner.

The Consultation Plan was developed based on the following objectives:

- Review of 2002 Approved Environmental Assessment for prescribed consultation requirements
- Notify stakeholders (Indigenous Communities, public and external agencies, etc.) of the intention to carry out the project
- Consult with directly affected stakeholders
- Provide timely opportunities for stakeholder input
- Constructively address input during the project
- Show how input received has been considered for the project
- Use appropriate notification methods to reach the range of stakeholders
- Use all reasonable efforts to resolve questions and concerns that may arise.

This process will not only promote education on the implementation of the Regulation process and manage expectations of the Project Team and stakeholders but will also result in a project that is transparent, open, traceable, timely, accountable and respectful.

4.3.2 Indigenous Consultation Plan

The project has the potential to impact Aboriginal rights such as the rights to hunt, fish, trap and gather. Per Section 15 of the Regulation, an Indigenous Consultation Plan (AECOM, 2022) was developed by the Project Team to provide a framework for how the

Ministry intends to consult and engage with Indigenous communities on the project, regarding communities' general interests and concerns. Anticipated potential impacts of the project will be discussed with the communities and will be assessed and accommodated / mitigated as appropriate.

The Ministry will continue to provide information and engage with communities regarding potential impacts to their rights through the following activities:

- Written communications
- Providing draft environmental and archaeological assessment reports for review and input
- Meetings with Chief and Council, Consultation Departments, Community Environmental Committees, etc. (as requested)
- Information sessions in communities (as requested)
- Focus group meetings with sectors of communities (hunters, youth, elders), (as requested);
- Project Website updates
- Discussing mitigation / accommodation measures that could be used to address adverse impacts of the project on Aboriginal and treaty rights (e.g., staging bridge work to avoid fish spawning seasons)
- Reporting back to communities on how their concerns have been addressed / reflected in the project
- Hiring Community Field Liaisons from communities for archaeological field work.

4.4 Indigenous Engagement and Consultation

As part of the overall project, Indigenous engagement consultation was undertaken to assist in the planning and determination of existing environmental conditions related to the project today compared to those previously identified as part of the Route Planning study for the Bradford Bypass and Technically Preferred Route (approved in 2002). Individuals and organizations consulted include:

- Indigenous communities
- External Agencies (including Provincial Ministries and Agencies, Federal Departments, and local Conservation Authorities)
- Municipalities
- Members of the public (including affected land and business owners, community/interest groups and the general public).

4.4.1 Engagement with Indigenous Communities

The Ministry remains committed to fulfilling its legal Duty to Consult requirements and will continue to engage and consult with local Indigenous communities and consider their interests in the Preliminary Design of this project, as well as future project stages. The Ministry prepared an Indigenous Consultation Plan in accordance with the Regulation and circulated the plan to Indigenous communities and the Ministry of Environmental, Conservation, and Parks. The Indigenous Consultation Plan was provided to Indigenous communities that have or may have existing Aboriginal or treaty rights, as recognized and affirmed in Section 35 of the Constitution Act, 1982, that may be impacted by the project, and Indigenous communities that may otherwise be interested in the project.

The following speaks to the Ministry's understanding of obligations and commitments to satisfy the Duty to Consult.

Section 35(1) of the Constitution Act, 1982 provides that, "The existing Aboriginal and treaty rights of the Aboriginal peoples of Canada are hereby recognized and affirmed." Over the years, the common law has developed as court decisions have determined how governments are to give meaning to the protection of Section 35 rights.

The Ministry is committed to fulfilling its Duty to Consult requirements with Indigenous communities regarding Section 35 rights by the following:

- Meaningfully consulting with First Nations and Métis communities about adverse impacts of the Ministry initiatives on their Aboriginal and treaty rights (fulfilling the Duty to Consult)
- Accommodating, where appropriate, the adverse impacts on Aboriginal and treaty rights
- Consideration and discussions between the Ministry and Indigenous communities for project participation through meetings, information sharing and involvement in field investigations.

Throughout this study, engagement and consultation with Indigenous communities has included:

- Access to general information and consultation through the Project Website (www.bradfordbypass.ca)
- Access to general communication through Project Telephone Line (1-877-247-6036);

- Inclusion on the Project Contact List to receive regular project updates and to ensure that the correct individuals may be consulted by the Project Team
- Receive email communications and contact the Project Team through a dedicated project email address (ProjectTeam@bradfordbypass.ca)
- Receive project specific mailings and notifications (via physical mail or email)
- Newspaper advertisements, and where appropriate, notifications will be provided in Indigenous community newspapers
- Indigenous community information sessions, and/or advance information sharing for Indigenous communities at the Public Information Centre (held virtually as a result of government restrictions of group events)
- Meetings and correspondence with Chiefs and Councils, or their delegates (see **Section 4.4.1.1**).

The Project Team has engaged with the following Indigenous communities:

- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Georgina Island First Nation
- Curve Lake First Nation
- Chippewas of Rama First Nation
- Hiawatha First Nation
- Kawartha Nishnawbe First Nation
- Mississaugas of Scugog Island First Nation
- Huron-Wendat Nation (regarding archaeological resources only)
- Métis Nation of Ontario - Georgian Bay Métis Council.

Initial outreach commenced in 2020, per the list above. Consultation activities related to the project continue to be ongoing.

4.4.1.1 Meetings with Indigenous Communities

Letters requesting to meet with Indigenous community representatives were prepared by the Project Team and distributed to all communities on November 29, 2021 to discuss project updates for the overall Bradford Bypass and County Road 4 Early Works.

Information has been distributed to all Indigenous communities and to date meetings have been held with communities based on the level of interest expressed and availability. Information packages were sent to Indigenous communities that did not express a specific interest to attend a meeting to ensure the information sharing process is thorough and transparent. Engagement and consultation with Indigenous communities will continue during and after the publication of this Draft Environmental Conditions Report, including throughout the next phase which includes the preparation and filing of the Environmental Impact Assessment Report.

Due to the COVID-19 pandemic, all project meetings were held virtually. **Table 4-2** outlines the meetings that were held with Indigenous communities throughout the study process.

4.4.1.2 Field Liaison During Archaeological Assessments

The Project Team is committed to working closely with Indigenous partners when carrying out archaeological assessments for the project. Community Field Liaisons from communities listed in **Section 4.4.1**, that have expressed an interest in participating as a Community Field Liaison were invited to participate in the archaeological assessments. Curve Lake First Nation and Huron-Wendat Nation expressed interest in participating and have been involved in Stage 2 archaeological assessments thus far. Additionally, both Curve Lake First Nation and Huron-Wendat Nation will be involved in future Stage 3 or 4 assessments if it is determined that the sites relate to Indigenous heritage on a site-by-site basis. Chippewas of Georgina Island First Nation and Chippewas of Rama First Nation have also requested to be kept apprised throughout the archaeology works and are sent updates as the assessments progress. In the future, any other Indigenous community listed in **Section 4.4.1** that expresses an interest in participating or receiving updates will be included in the archaeological assessment field liaison process, either through participation or the sharing of information.

Table 4-2: Summary of Meetings with Indigenous Communities

Meeting Date	Meeting Attendees	Meeting Summary	Key Issues Raised	Project Team Response / Action
December 2, 2020	<ul style="list-style-type: none"> Huron-Wendat Nation Project Team. 	<ul style="list-style-type: none"> Provided an overview of the project, the Study Area, environmental components of the project, specifically relating to archaeological investigations, and discussed any questions or concerns expressed by the community. Attendees from Huron-Wendat Nation expressed interest in the consultation process, the Ministry's policy review process and Archaeological Assessments underway for the project. 	<ul style="list-style-type: none"> Huron-Wendat Nation requested to be respected and notified about Stage 2 and Stage 3 Archaeological Assessments. Huron-Wendat Nation requested a meeting with the Ministry regarding the Ministry 's policy review process. 	<ul style="list-style-type: none"> The Project Team will keep Huron-Wendat Nation informed about ongoing archaeological assessments. The Project Team welcomes the opportunity to discuss the Huron-Wendat Nation's interest and feedback, and will provide the latest available edition of the policy.
July 15, 2021	<ul style="list-style-type: none"> Curve Lake First Nation Project Team. 	<ul style="list-style-type: none"> Provided a project update and discussed any questions or concerns expressed by the community. 	<ul style="list-style-type: none"> Curve Lake First Nation requested that the Ministry continue with the Class Environmental Assessment process and noted they would like to understand the purpose of the Regulation Curve Lake First Nation requested to be involved in field investigations, in particular investigations at the Holland River crossings. 	<ul style="list-style-type: none"> The Project Team noted that environmental studies will be proceeding regardless of the regulation followed. The Project Team will keep Curve Lake First Nation informed about ongoing archaeological assessments and create a working group with Williams Treaty First Nations.
September 23, 2021	<ul style="list-style-type: none"> Williams Treaty First Nations Chippewas of Georgina Island First Nation Kawartha Nishnawbe First Nation Hiawatha First Nation Mississaugas of Scugog Island First Nation Project Team. 	<ul style="list-style-type: none"> Provided a project update and discussed any questions or concerns expressed by the communities. 	<ul style="list-style-type: none"> Hiawatha First Nation requested for a meeting summary to be circulated to communities that were unable to attend. Mississaugas of Scugog Island First Nation requested a list of specialist reports that are being prepared as part of the project. 	<ul style="list-style-type: none"> The Project Team circulated a meeting summary to all invitees and attendees. The Project Team directed attendees to the Project Website for a list of specialist reports.
October 26, 2021	<ul style="list-style-type: none"> Huron-Wendat Nation Project Team. 	<ul style="list-style-type: none"> Provided a project update and discussed any questions or concerns expressed by the community. 	<ul style="list-style-type: none"> Attendees from Huron-Wendat Nation expressed their expectation to continue to be involved in the archaeological assessments throughout the Early Works and the Bradford Bypass studies. 	<ul style="list-style-type: none"> The Project Team committed to including Huron Wendat Nation in the archaeological assessments on both the Early Works and the Bradford Bypass project
December 7, 2021	<ul style="list-style-type: none"> Mississaugas of Scugog Island First Nation Project Team. 	<ul style="list-style-type: none"> Provided a project update and discussed any questions or concerns expressed by the community. Attendees expressed interest in being actively involved in the project and to be kept apprised of all reports once available. 	<ul style="list-style-type: none"> Mississaugas of Scugog Island First Nation requested to be kept informed of all reporting in relation to the project. 	<ul style="list-style-type: none"> The Project Team will keep Mississaugas of Scugog Island First Nation informed about all reports for the project.

Meeting Date	Meeting Attendees	Meeting Summary	Key Issues Raised	Project Team Response / Action
March 23, 2022	<ul style="list-style-type: none"> Huron-Wendat Nation Project Team. 	<ul style="list-style-type: none"> Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
March 25, 2022	<ul style="list-style-type: none"> Chippewas of Rama First Nation Project Team. 	<ul style="list-style-type: none"> Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. Attendees expressed an interest in being actively involved in the archaeological assessments throughout the Bradford Bypass studies. 	<ul style="list-style-type: none"> Chippewas of Rama First Nation requested link to environmental studies and reports be provided. Chippewas of Rama First Nation requested to be included on the weekly distribution list to keep the Chippewas of Rama First Nation updated with the latest project information. Chippewas of Rama First Nation requested to be present for the Stage 3 Archaeological Assessment. 	<ul style="list-style-type: none"> The Project Team will keep Chippewas of Rama First Nation informed about all reports for the project. The Project Team included the Chippewas of Rama First Nation on weekly project updates. The Project Team will give advance notice to the Chippewas of Rama First Nation of when Stage 3 Archaeological Assessments will be undertaken.
March 30, 2022	<ul style="list-style-type: none"> Mississaugas of Scugog Island First Nation Project Team. 	<ul style="list-style-type: none"> Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. Attendees from Mississaugas of Scugog First Nation expressed an interest in the Archaeological Assessments underway for the project and alignment refinement areas. 	<ul style="list-style-type: none"> Mississaugas of Scugog First Nation requested information on specific archaeological sites. Mississaugas of Scugog First Nation requested to review all completed archaeology reports. 	<ul style="list-style-type: none"> The Project Team provided the requested information. The Project Team distributed the archaeology reports.
April 27, 2022	<ul style="list-style-type: none"> Williams Treaty First Nation Co-ordinator Project Team. 	<ul style="list-style-type: none"> Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. Attendees expressed an interest in being actively involved in archaeological assessments and requested to be informed of waste management, drainage, stormwater management assessments. 	<ul style="list-style-type: none"> Williams Treaty First Nation requested for meeting materials to be distributed. Williams Treaty First Nation noted that contact information for Chippewas of Georgina Island First Nation had recently changed. Williams Treaty First Nation requested for bimonthly consultation sessions with each of the seven Williams Treaty First Nations. Williams Treaty First Nation requested a meeting with the Project Team archaeologists to get updated archaeological site information. Williams Treaty First Nation requested contact information for the Ministry of the Environment, Conservation and Parks. Williams Treaty First Nation requested materials from previous meetings. Williams Treaty First Nation requested copies of all completed archaeological reports. Williams Treaty Co-ordinator indicated an all Chiefs meeting was scheduled for May 5 and would carry this information to the Chiefs, and report back to the Ministry on any feedback/ information requests. 	<ul style="list-style-type: none"> The Project Team distributed meeting materials and a meeting summary to all invitees and attendees. The Project Team updated the contact information for Chippewas of Georgina Island First Nation. The Project Team agreed and will reach out to Williams Treaty First Nation once more details are available following the writ period. The Project Team agreed to set up a meeting to discuss archaeological sites. The Project Team agreed to provide Ministry of the Environment, Conservation and Parks contact information. The Project Team agreed to provide previous meeting materials and archaeological reports. Williams Treaty Co-ordinator to follow-up with the Ministry on results on May 5 all Chiefs briefing.

Meeting Date	Meeting Attendees	Meeting Summary	Key Issues Raised	Project Team Response / Action
July 29, 2022	<ul style="list-style-type: none"> ■ Curve Lake First Nation ■ Hiawatha First Nation ■ Mississaugas of Scugog Island First Nation ■ Williams Treaty First Nation ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. ■ Attendees expressed an interest in being involved with the impact assessments for the various environmental disciplines. 	<ul style="list-style-type: none"> ■ Williams Treaty First Nation requested the Draft Environmental Conditions Report be provided to Indigenous Nations in advance of the public. ■ Williams Treaty First Nation and Curve Lake First Nation requested to review impact assessment reports. ■ Curve Lake First Nation asked if the 2020 Fish and Fish Habitat Existing Conditions Report (AECOM, 2020) and 2020 Terrestrial Ecosystems Existing Conditions Report (AECOM, 2020) were a desk-top review only with no in-field sampling. ■ Williams Treaty First Nation requested all artifacts removed be repatriated to the Indigenous Nations. ■ Williams Treaty First Nation stated they will provide the Project Team an Indigenous consultation plan highlighting details on how they wish to be consulted with, along with a draft workplan and budget. ■ Williams Treaty First Nation has requested a database to share and review reports for this project. 	<ul style="list-style-type: none"> ■ The Project Team provided the Draft Environmental Conditions Report the morning of August 12th, 2022 prior to going live to the public. ■ The Project Team confirmed environmental technical reports will be made available for review upon request by Indigenous Nations, and the Ministry of Transportation will arrange additional meetings to provide updates and details on the reports. ■ The Project Team confirmed that desktop reviews were completed during the 2020 environmental assessment, and field investigations took place during the preliminary design phase. ■ The Project Team will connect with Indigenous Nations to repatriate the artifacts where possible. ■ The Project Team acknowledged the Indigenous Consultation Plan, and is awaiting Williams Treaty First Nation's submission. ■ The Project Team is looking into the request to provide the database.
August 23, 2022	<ul style="list-style-type: none"> ■ Chippewas of Georgina Island First Nation ■ Hiawatha First Nation ■ Curve Lake First Nation ■ Chippewas of Rama First Nation ■ Williams Treaty First Nation ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an update on the County Road 4 Early Works and the overall Bradford Bypass project. ■ Summarized findings in the Draft Environmental Conditions Report 	<ul style="list-style-type: none"> ■ Curve Lake First Nation expressed concerns with a 30-day review period for the entire Bradford Bypass project. ■ Chippewas of Rama First Nation requested information on the archaeological findings of the East Holland River Site. ■ Chippewas of Georgina Island First Nation requested a copy of the 2002 Route Planning and Environmental Study Report. ■ Curve Lake First Nation identified new species, the Northern Sunfish, throughout the Holland River and Holland River East Branch. ■ Curve Lake First Nation requested Ecological Land Classification to be provided in an excel table format. 	<ul style="list-style-type: none"> ■ The Project Team clarified the 30-day review period is strictly for the Draft Environmental Conditions Report, and Indigenous Nations can submit their comments at any time throughout the Preliminary Design. ■ The Project Team confirmed the findings consisted of pre-contact pottery and historic Euro-Canadian materials. ■ The Project Team provided a copy of the 2002 Route Planning and Environmental Study Report. ■ The Project Team forwarded the information on the Northern Sunfish to the Fish and Fish Habitat specialists. ■ The Project Team to provide Ecological Land Classification data.

Meeting Date	Meeting Attendees	Meeting Summary	Key Issues Raised	Project Team Response / Action
			<ul style="list-style-type: none"> ■ Hiawatha First Nation asked what the colour-coordinated areas represented for the terrestrial mapping. ■ Chippewas of Georgina Island First Nation asked if the air quality assessment is limited to impacts during the construction phase. ■ Hiawatha First Nation asked if any Indigenous Nations provided field liaisons. ■ Hiawatha First Nation requested a doodle poll be circulated for future meetings. 	<ul style="list-style-type: none"> ■ The Project Team confirmed the blue area represents potential Butternut, green represents potential Bat species at risk, and purple represents whip-poor-will. ■ The Project Team confirmed the air quality assessment will assess impacts during the construction phase, and air quality modelling is being completed to assess impacts following construction. ■ The Project Team confirmed that Huron-Wendat Nation, Curve Lake First Nation, and Chippewas of Georgina Island First Nation provided field liaisons. ■ The Project Team confirmed a doodle poll will be circulated with a list of dates for future meetings.

4.5 Stakeholder Engagement and Consultation

4.5.1 Engagement with Municipal Stakeholders

Staff from the following municipalities were engaged throughout the study process:

- County of Simcoe
- Bradford West Gwillimbury
- East Gwillimbury
- York Region
- King Township.

In addition to the municipalities above, the Town of Newmarket also received a copy of the Notice of Publication of Draft Early Works Report, Notice of Publication of Final Early Works Report, and Notice of Publication of Draft Environmental Conditions Report in accordance with the Regulation.

Due to the COVID-19 pandemic, all project meetings were held virtually. **Table 4-3** summarizes the meetings that took place with Municipal Stakeholders throughout the project. Meeting materials as well as all correspondence records with Municipal Stakeholders until May 31, 2022 are provided in **Appendix B** of this Report.

Table 4-3: Summary of Meetings with Municipal Stakeholders

Meeting Date	Meeting Attendees	Meeting Summary
July 29, 2020	<ul style="list-style-type: none"> ■ Simcoe County ■ Project Team 	<ul style="list-style-type: none"> ■ Discussed the proposed Simcoe County widening project on County Road 4, and an overview of the project. ■ Key discussion items included acquiring additional properties, permits, and roundabouts.
October 13, 2020	<ul style="list-style-type: none"> ■ Simcoe County ■ Town of Bradford West Gwillimbury ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an introduction to the project, upcoming project milestones, public consultation activities and key objectives of the project. ■ Key discussion items included support for the project, project funding, project naming, interchange locations, impacts to municipal roads, and intersection reconfigurations.
October 20, 2020	<ul style="list-style-type: none"> ■ Town of East Gwillimbury ■ York Region ■ King Township ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an introduction to the project, upcoming project milestones, public consultation activities and key objectives of the project. ■ Key discussion items included existing utilities, information requests, construction timelines and project funding.
March 30, 2021	<ul style="list-style-type: none"> ■ Simcoe County ■ Town of Bradford West Gwillimbury ■ Town of East Gwillimbury ■ York Region ■ King Township ■ Project Team 	<ul style="list-style-type: none"> ■ Provided a project overview, overview of the design, consultation activities, study process, and ongoing environmental and engineering studies ■ Key discussion items included locations of interchanges and interchange design, early works approvals, existing noise walls, funding, traffic impacts, Impact Assessment Agency of Canada decision, and consultation activities.
July 28, 2021	<ul style="list-style-type: none"> ■ Town of Bradford West Gwillimbury ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the project. ■ Key discussion items included active transportation, municipal road crossings, proposed cross-sections of Professor Day Drive, proposed culverts, watercourse crossings, wildlife crossings, and property acquisition.
July 29, 2021	<ul style="list-style-type: none"> ■ Town of East Gwillimbury ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the project. ■ Key discussion items included active transportation, water transportation, project alignment, and future correspondence with the Town of East Gwillimbury.
September 22, 2021	<ul style="list-style-type: none"> ■ Town of Bradford West Gwillimbury ■ County of Simcoe ■ Project Team 	<ul style="list-style-type: none"> ■ Provided a project overview, project schedule, existing conditions, the design, construction staging, potential impacts and approvals for Country Road 4 ■ Key discussion items included changes in design speed, co-ordination of the widening of County Road 4 on behalf of the County of Simcoe, construction limits, realignments, and potential impacts were also discussed.
November 25, 2021	<ul style="list-style-type: none"> ■ Town of Bradford West Gwillimbury ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the project. ■ Key discussion items included opportunities for incorporating active transportation elements (e.g., trail facilities) as the study continues to advance.
December 10, 2021	<ul style="list-style-type: none"> ■ Town of East Gwillimbury ■ Project Team. 	<ul style="list-style-type: none"> ■ Provided an overview of the project. ■ Key discussion items included cross-sections, updates to the Transportation Master Plan, active transportation, property acquisition, and interchange locations.
January 20, 2022	<ul style="list-style-type: none"> ■ York Region ■ County of Simcoe ■ King Fire and Emergency Services ■ South Simcoe Police ■ Bradford West Gwillimbury Fire & Emergency Services ■ Township of King ■ Town of Bradford West Gwillimbury ■ Town of East Gwillimbury ■ Project Team. 	<ul style="list-style-type: none"> ■ Provided a project overview, overview of the environmental assessment process, project schedule, County Road 4 Early Works, and current status of the project ■ Key discussion items included County Road 4 issues resolution process, interchange design alternatives, construction timelines and stages, existing rail lines and hydro towers, and potential impacts.
August 24, 2022	<ul style="list-style-type: none"> ■ King Township ■ Project Team 	<ul style="list-style-type: none"> ■ Key discussion items included consideration for utilizing the Hochreiter Road allowance connected to Bathurst Steet.

4.5.2 Engagement with Technical Stakeholders

Technical stakeholders engaged throughout the project to-date include federal, provincial and municipal agencies, conservation authorities and other technical stakeholders (e.g., utility companies). For the full list of technical stakeholders, refer to the list below:

Federal Agencies

- Fisheries and Oceans Canada
- Indigenous and Northern Affairs Canada
- Transport Canada
- Impact Assessment Agency of Canada
- Environment and Climate Change Canada
- Canadian Transportation Agency.
- Public Health Agency of Canada
- Historic Sites and Monuments Board of Canada
- Environment and Climate Change Canada

Provincial Agencies

- Ministry of Indigenous Affairs
- Ministry of the Environment, Conservation and Parks
- Ministry of Municipal Affairs and Housing
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Ministry of Citizenship and Multiculturalism
- Ministry of Health and Long-Term Care
- Ministry of Natural Resources and Forestry
- Ministry of Energy
- Ministry of the Solicitor General
- Infrastructure Ontario
- Metrolinx
- Ministry of Economic Development, Job Creation and Trade
- Ontario Provincial Police
- Ontario Federation of Agriculture.

Municipal Agencies

- Town of East Gwillimbury
- County of Simcoe
- Township of King
- Town of Bradford West Gwillimbury
- York Region

- Central York Fire Services
- York Regional Police
- South Simcoe Police Services
- Queensville Fire
- King Fire and Emergency Services
- Bradford West Gwillimbury Fire and Emergency Services
- East Gwillimbury Fire Services
- York Catholic District School Board
- York Region District School Board
- Simcoe County District School Board
- Conseil scolaire catholique MonAvenir
- Conseil scolaire Viamonde
- Student Transportation Services of York Region
- York Region Transit
- Bradford West Gwillimbury Public Library
- King Chamber of Commerce
- East Gwillimbury Chamber of Commerce
- Bradford Board of Trade
- The Corporation of the County of Simcoe
- Holland Marsh Drainage System Joint Municipal Services Board.

Conservation Authorities

- Lake Simcoe Region Conservation Authority
- Nottawasaga Valley Conservation Authority.

Other Technical Stakeholders

- Ontario Trucking Association
- Oak Ridges Moraine Foundation
- Canadian National Rail
- Canadian Pacific Rail
- The Friends of the Greenbelt Foundation
- York Simcoe Naturalists.

An Environment, Community and Agriculture Committee was also formed for the project to understand and address community concerns and gather input on how to best implement the project in a context sensitive manner. The committee is comprised of representatives from local communities and stakeholder groups that have focused interest or lands within the Study Area.

In addition to the stakeholders listed above, consultation and meetings with utility companies is ongoing to confirm potential impacts to existing utilities within the Study Area.

Due to the COVID-19 pandemic, all project meetings were held virtually. **Table 4-4** summarizes the meetings that took place with Technical Stakeholders throughout the project. Meeting materials as well as all correspondence records with Technical Stakeholders until May 31, 2022 are provided in **Appendix B** of this Report.

4.5.3 Engagement with Elected Officials

Elected Officials were engaged throughout the project to-date. The following Elected Officials were engaged throughout the study process, participated in briefings with the Ministry during key milestones, were provided with the opportunity to review this Draft Environmental Conditions Report, and were also provided with the Notice of Draft Environmental Conditions Report:

- Scot Davidson, Minister of Parliament – York – Simcoe
- Caroline Mulroney, Minister of Provincial Parliament – York – Simcoe
- Steve Pellegrini, Mayor – Township of King
- Rob Keffer, Mayor – Town of Bradford West Gwillimbury
- Virginia Hackson, Mayor - Town of East Gwillimbury
- James Leduc, Deputy Mayor - Town of Bradford West Gwillimbury
- Jordan Cescolini, Councillor Ward 1 – Township of King
- David Boyd, Councillor Ward 2 – Township of King
- Jakob Schneider, Councillor Ward 3 – Township of King
- Bill Cober, Councillor Ward 4 – Township of King
- Debbie Schaefer, Councillor Ward 5 – Township of King
- Avia Eek, Councillor Ward 6 – Township of King
- Raj Sanhu, Councillor Ward 1 – Town of Bradford West Gwillimbury
- Gary Lamb, Councillor Ward 3 – Town of West Gwillimbury
- Ron Orr, Councillor Ward 4 – Town of West Gwillimbury
- Peter Ferragine, Councillor Ward 5 - Town of West Gwillimbury
- Mark Contois, Councillor Ward 6 - Town of West Gwillimbury
- Peter Dykie Jr., Councillor Ward 7 - Town of West Gwillimbury
- Lorelea Carruthers, Councillor Ward 1 - Town of East Gwillimbury
- Terry Foster, Councillor Ward 1 - Town of East Gwillimbury
- Tara Roy-DiClemente, Councillor Ward 2 - Town of East Gwillimbury
- Joe Persechini, Councillor Ward 2 - Town of East Gwillimbury
- Jonathan Scott, Councillor Ward 2 - Town of East Gwillimbury
- Scott Crone, Councillor Ward 3 - Town of East Gwillimbury
- Cathy Morton, Councillor Ward 3 - Town of East Gwillimbury.

Table 4-4: Summary of Meetings with Technical Stakeholders

Meeting Date	Meeting Attendees	Meeting Summary
May 3, 2021	<ul style="list-style-type: none"> ■ Hydro One ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the project and an overview of each of the 3 alternatives at Leslie Street. Hydro One noted preference for Alternative 1 as it appears to avoid impacts to transmission towers. ■ Key discussion items included horizontal and vertical clearances from the towers, and Hydro One access to towers for maintenance.
May 10, 2021	<ul style="list-style-type: none"> ■ Hydro One ■ Project Team 	<ul style="list-style-type: none"> ■ Provided overview of the Preliminary Design schedule. ■ Discussion items included three key tower crossing locations near Professor's Day Drive, east of County Road 4 in Bradford, hydro towers west of Leslie Street (north of Queensville Side Road), and hydro crossing at Highway 404 (north of Holborn Road).
September 29, 2021	<ul style="list-style-type: none"> ■ Bradford West Gwillimbury Fire and Emergency Services ■ King Fire and Emergency Services ■ South Simcoe Police Services ■ Project Team 	<ul style="list-style-type: none"> ■ Provided a project overview, and overview of the design and construction staging. ■ Key discussion items included construction staging and the implementation of the new detour route to ensure continued access to County Road 4 and communication plans for advance notice to emergency services of any changes as the project progresses.
November 26, 2021	<ul style="list-style-type: none"> ■ Hydro One ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the materials previously provided by the Project Team. ■ Key discussion items included clearance requirements for crossings at Leslie Street and Highway 404 and continued consultation with Hydro One as the design advances.
December 8, 2021	<ul style="list-style-type: none"> ■ Environment, Community and Agriculture Committee ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an update on the County Road 4 Early Works and updated to the overall project. ■ County Road 4 Early Works were discussed in further detail in a breakout portion of the meeting.
January 25, 2022	<ul style="list-style-type: none"> ■ Lake Simcoe Region Conservation Authority ■ Nottawasaga Valley Conservation Authority ■ Ministry of Citizenship and Multiculturalism ■ Ministry of Natural Resources and Forestry ■ Ministry of Energy ■ Ministry of the Environment, Conservation and Parks ■ Ministry of Agriculture, Food and Rural Affairs ■ Ministry of Health and Long-Term Care ■ Transport Canada ■ Ontario Federation of Agriculture ■ Metrolinx ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the project, study process, project schedule, proposed interchanges, and an update on the County Road 4 Early Works. ■ Key discussion items included the floodplain hazards and modelling, archaeological assessments at the Holland River East Branch, design alternatives, and agricultural impact assessment requirements.
February 17, 2022	<ul style="list-style-type: none"> ■ Lake Simcoe Region Conservation Authority ■ Project Team 	<ul style="list-style-type: none"> ■ Presented the results from hydraulic modelling for the Holland River and Holland River East Branch. ■ Key discussion items included technical details related to the Polder Area for the Holland River, the County Road 4 Stormwater Management Plan, and ongoing consultation with the Lake Simcoe Region Conservation Authority.
March 9, 2022	<ul style="list-style-type: none"> ■ Lake Simcoe Region Conservation Authority ■ Ministry of the Environment, Conservation and Parks ■ Fisheries and Oceans Canada ■ Transport Canada ■ Project Team 	<ul style="list-style-type: none"> ■ Discussed preliminary structural designs and environmental constraints for the proposed Holland River and Holland River East Branch crossings. ■ Key discussion items included maintenance and footprints for a stormwater management facility, infiltration measures, culverts and fisheries, and environmental permits and approvals.

Meeting Date	Meeting Attendees	Meeting Summary
March 28, 2022	<ul style="list-style-type: none"> ■ Metrolinx ■ Project Team 	<ul style="list-style-type: none"> ■ Discussed the Bradford Bypass and Metrolinx rail crossing, specifically existing conditions, impacts to the Barrie GO Expansion crossing assumptions, clearances, access, structures, and drainage.
April 12, 2022	<ul style="list-style-type: none"> ■ Nottawasaga Valley Conservation Authority ■ Project Team 	<ul style="list-style-type: none"> ■ Discussed the existing and proposed drainage conditions of the tributary of Penville Creek. ■ Key discussion items included guidelines and design standards for stormwater management facilities, modelling requirements for a flood hazard assessment, and Erosion and Sediment Control checklists.
May 13, 2022	<ul style="list-style-type: none"> ■ Hydro One ■ Project Team 	<ul style="list-style-type: none"> ■ Provided an overview of the design, the Environmental Assessment Approved Route, project schedule and study area and refinement locations. ■ Key discussion items included review of the alternatives for the Leslie Street and the Highway 404 crossings, and the required clearances and elevations for the Hydro One transmission lines and crossings to be taken into consideration in the design.

Meeting materials as well as all correspondence records with Elected Officials until May 31, 2022 are provided in **Appendix B** of this Report.

4.6 Public Consultation Opportunities

4.6.1 Public Information Centre #1

A Public Information Centre was held for the project in April and May 2021. The Public Information Centre was held virtually in two parts via the Project Website.

- **Public Information Centre Part 1:** The purpose of the first Public Information Centre was to showcase the overall project, update and summarize the existing conditions since 2002, illustrate the new Preliminary Design refinements as compared to the 2002 Approved Environmental Assessment for the Technically Preferred Route of the Bradford Bypass, outline the evaluation criteria, and solicit input, feedback, and comments on the Preliminary Design refinements. The materials presented at the Public Information Centre were made available on the Project Website for a two-week stakeholder review period beginning April 22, 2021 and ending on May 6, 2021
- **Public Information Centre Part 2:** Additionally as part of Public Information Centre #1, the Project Team hosted a Public Information Centre Webinar presentation on May 18, 2021 held from 7:00 p.m. to 10:00 p.m. where stakeholders were able to learn more about key topics raised during the first Public Information Centre, and comments submitted during the stakeholder review period. Stakeholder were also able to receive additional project information.

A second Public Information Centre (Public Information Centre #2) is anticipated to occur in Fall 2022. At Public Information Centre #2, the Project Team will present the preferred alternative for the project. Details of Public Information Centre #2 and feedback received will be summarized in the Environmental Impact Assessment Report, to be provided under separate cover.

4.6.1.1 Engagement Materials

The following section provides an overview of the materials used for communication and engagement tools with participants as part of the Public Information Centre #1.

4.6.1.1.1 Part 1 – Information Webpages

A welcome video was included on the Public Information Centre #1 landing page (<https://www.bradfordbypass.ca/pic1/#1>), which provided a brief overview of the project, the format of the Public Information Centre, and how stakeholders could participate and submit feedback on the materials presented. The information pages presented at Public Information Centre #1 Part 1 included the following:

- Project Overview
- Study Process
- Refinements and Alternatives Evaluation Process
- Overall Considerations for Bradford Bypass Project
- Considerations for the Bradford Bypass Project
- Overall Environmental Considerations Bradford Bypass
- Environmental Protection and Mitigation Measures
- Environmental Protection and Mitigation Measures – Examples from other Ministry of Transportation Projects
- General Design Refinements
- Bradford Bypass Mainline Refinement – Holland River East Branch Crossing
- Bradford Bypass Mainline Refinement – Hydro Tower Relocation
- 2002 Approved Environmental Assessment Highway 400 Interchange
- Highway 400 Refinement Alternatives
- 2002 Approved Environmental Assessment Highway 404 Interchange
- Highway 404 Refinement Alternatives
- County Road 4 Interchange
- Bathurst Street Interchange
- Leslie Street Interchange
- Thank You & Next Steps.

After reviewing the above website pages, stakeholders were virtually guided and encouraged to complete a poll to obtain information about the demographics of respondents, their key concerns, and how they plan to use the Bradford Bypass. The questions consisted of the following:

- Please rank these factors in order of importance to you:
 - Transportation & Engineering
 - Natural Environment
 - Socio-Economic Environment
 - Cultural Environment.

- Please select the top five (5) most important evaluation criteria to you:
 - Active Transportation, Recreation and Navigation
 - Archaeological and Built Heritage Resources
 - Climate Change and Air Quality
 - Environmentally Sensitive Areas and Wetlands
 - Highway Operations and Safety
 - Human Health
 - Noise and Vibration
 - Land Use, Economics and Agriculture
 - Plants and Wildlife (Species at Risk)
 - Surface Water and Groundwater.

- Where do you live (select the most appropriate)?
 - Bradford West Gwillimbury
 - East Gwillimbury
 - King Township
 - County of Simcoe
 - Regional Municipality of York
 - None of the above.

- How often do you anticipate using the Bradford Bypass for personal travel?
 - Frequently
 - Occasionally
 - Rarely
 - Not Applicable.

- How often do you anticipate using the Bradford Bypass for work or business travel?
 - Frequently
 - Occasionally
 - Rarely
 - Not Applicable.

Materials from Public Information Centre #1 Part 1 are provided in **Appendix B** of this Report.

4.6.1.1.2 Part 2 – Webinar

To provide another layer of engagement with stakeholders in the absence of in-person consultation events, the Project Team held a webinar (through the Zoom platform) on May 18, 2021. Members of the Project Team attended the webinar and provided a live voice-over presentation accompanied by a PowerPoint slide deck. Information presented included a brief overview of the study, results of Public Information Centre #1 Part 1, and questions/answers developed based on stakeholder feedback received during the review period.

The questions presented at the webinar were selected based on feedback received from stakeholders during the Public Information Centre #1 review period (April 22 – May 6, 2021). The Project Team identified common themes from stakeholder comments and questions and developed questions and answers to address as many of these themes as possible. The intent was not to provide a response to every question, but to speak to the common individual themes and topics as a way of supplementing the virtual Public Information Centre and to provide an initial response to a larger group. The wording of the question was phrased using the theme or topic of several questions to avoid potential privacy concerns and to best capture a broader range of questions.

A recording of the webinar was made available on the Project Website for those unable to attend the live event and shall remain available for the duration of the project.

4.6.1.2 Summary of Feedback Received

Data identified that 1,665 individuals visited the virtual Public Information Centre #1 from April 22, 2021 - May 6, 2021. During that period 65 comments were received, and 49 individuals completed the poll. Registry details recorded 130 individuals registered in advance for the Public Information Centre #1 webinar presentation through Zoom, whereas only 76 individuals attended the presentation on May 18, 2021. During the presentation, 27 new comments were received via the Zoom platform chat function. The 92 comments received comprise the total public comment participation for this event.

The following section highlights the key findings and level of public interest related to topics / questions identified through Public Information Centre #1. The following eight themes emerged from the feedback and comments received:

- Community Engagement Process and Activities
- Environmental Concerns – Natural Environment
- Environmental Concerns – Social and Economic Environment
- Engineering, Transportation and Design
- Project Planning and Timelines
- Interchange Locations and Design
- Environmental Assessment Process
- General Project and Proposed Alignment.

Table 4-5 summarizes the key questions, comments, issues, and concerns raised during Public Information Centre #1 and the Project Team's response. Prepared responses were issued directly to the commenter via email.

A copy of the Public Information Centre #1 Summary Report is provided in **Appendix B** of this report.

Table 4-5: Summary of Feedback from Public Information Centre #1

Comment Theme	Summary of Comments Received	Project Team Response
Community Engagement Process and Activities	<ul style="list-style-type: none"> ■ Several individuals requested to be added to the contact list ■ A few individuals expressed concern regarding the level of detail presented during Public Information Centre #1 and the questions asked during the survey ■ A few individuals inquired about how to participate in the webinar portion of Public Information Centre #1 ■ One individual expressed disappointment in their view that Huron-Wendat's concerns were not fully being represented in the Federal Impact Assessment. 	<ul style="list-style-type: none"> ■ Individuals were added to the project contact list and acknowledgement provided ■ Concerns with the material presented during Public Information Centre #1 were acknowledged and additional information was provided to supplement project data/studies ■ Individuals who had technical issues with the Public Information Centre #1 materials were provided with assistance and links to the webinar registration, as required ■ Confirmation that the Project Team has engaged and consulted with and continues to engage and consult with Indigenous communities as part of this project.
Environmental Concerns – Natural Environment	<ul style="list-style-type: none"> ■ Several individuals expressed concerns regarding surface water and runoff from the Bradford Bypass into Lake Simcoe and the Holland River ■ Two individuals expressed concerns about groundwater and if the construction of the Bradford Bypass will impact the quality of well water ■ Several concerns were raised regarding impacts to the surrounding environment, specifically flora and fauna, wetlands, trees, wildlife corridors and habitats, and Species At Risk ■ One individual noted that there are 11 locations within the area of interest for Lake Simcoe Region Conservation Authority and provided suggestions and recommendations to mitigate impacts ■ Two individuals expressed concern regarding environmental impacts and assessments at the Holland River East Branch Crossing. 	<ul style="list-style-type: none"> ■ Provision of details outlining the approach taken to conduct surface water assessment as part of the project, confirmation that Lake Simcoe Region Conservation Authority and Nottawasaga Valley Conservation Authority will be conducted throughout the project, and confirmation that the Ministry will assess impacts with respect to the Lake Simcoe Protection Act ■ Provision of details outlining the approach taken to conduct a groundwater assessment as part of the project ■ Provision of details outlining the approach taken to conduct a terrestrial assessment that includes evaluation of wildlife crossings / exclusion fence, and confirmation that the Project Team is continuing to consult with regulatory agencies throughout all project phases ■ Confirmation that the project involves completing surface water, groundwater, terrestrial, and fisheries assessments, and the Project Team will consult with Lake Simcoe Region Conservation Authority to discuss any key issues related to the project ■ Concerns regarding the Holland River East Branch Crossing will be factored into evaluation criteria, where appropriate.
Environmental Concerns – Social and Economic Environment	<ul style="list-style-type: none"> ■ Several individuals expressed concern regarding impacts to adjacent properties, expropriation of land and the legislative process for land expropriation ■ Several individuals expressed concern regarding impacts to prime agricultural lands and specialty crop areas and requested to know where local produce will be grown once the land is paved ■ Several individuals expressed concern regarding impacts to adjacent land uses ■ Several individuals expressed concern regarding noise and vibration levels and mitigation measures to reduce these impacts ■ A few individuals expressed concern regarding air quality during construction and operation of the Bradford Bypass. 	<ul style="list-style-type: none"> ■ Confirmation that the Ministry works directly with impacted property owners to discuss property-specific concerns and noted that land expropriation is only used when agreements cannot be reached within suitable project timeframes. ■ Confirmation that an Agricultural Impact Assessment will be completed, and consultation with local farming communities and the Ontario Ministry of Agriculture, Farming and Rural Affairs is ongoing ■ Confirmation that various studies are being undertaken as part of the project, including Land Use, Noise, Air Quality, etc., which identify potential impacts on directly impacted or adjacent residents ■ Confirmation that the Ministry is undertaking a noise and vibration assessment as part of the project and will follow the Ministry's Noise Guide to evaluate noise barrier types and locations ■ Confirmation that the Ministry is undertaking an air quality assessment as part of the project in accordance with the Air Quality guidelines.

Comment Theme	Summary of Comments Received	Project Team Response
Engineering, Transportation and Design	<ul style="list-style-type: none"> ■ One individual asked if a Value Engineering study is being completed ■ One individual inquired about installing dynamic charging stations for electric vehicles ■ One individual noted that the majority of the webinar survey respondents said they would not use the Bradford Bypass and requested to know why the project is being carried forward rather than improving congestion on Highway 404 ■ One individual inquired about the overpass at 10th Sideroad ■ One individual expressed concern regarding impacts to a sanitary trunk sewer that is proposed along Highway 400 and County Road 88 ■ Several individuals requested further information on the reduction of travel time and traffic congestion ■ A few individuals provided suggestions for municipal/regional roads, including the number of lanes, speed limits, carpool lots, and pedestrian access. 	<ul style="list-style-type: none"> ■ Confirmation that a Value Engineering Workshop will be held in Spring 2022 where applicable ■ Confirmation that dynamic charging stations are not included in current plans for the project but may be explored at a later stage of design for the project ■ Details provided regarding the rationale for the Bradford Bypass including, travel time savings and population projections ■ Confirmation that the proposed overpass structure at 10th Sideroad represents a design refinement allowing the freeway to best fit within the topography of the area ■ Confirmation that the Project Team is consulting with municipalities and will take into consideration land use planning and sewer information within the Study Area ■ Explanation that travel-time savings were calculated using the Provincial Greater Golden Horseshoe Transportation Model and the location of the Bradford Bypass was chosen following evaluations as part of the 2002 Approved Environmental Assessment ■ Road recommendations were acknowledged, and a noted that suggested provided will be factored into the evaluation criteria, where appropriate.
Project Planning and Timelines	<ul style="list-style-type: none"> ■ Several individuals inquired about project and construction timelines ■ Several individuals inquired about implications to the project as a result of changes in government. 	<ul style="list-style-type: none"> ■ Details provided on the schedule for this Preliminary Design, as well as subsequent design and construction stages ■ Confirmation that, at the time of Public Information Centre #1 the Ministry is proceeding with the Preliminary Design study, and that project-related decisions resulting from a change in government are not yet known.
Interchange Locations and Design	<ul style="list-style-type: none"> ■ Several individuals provided support for interchange locations, and requested more information on interchange alternatives and design, specifically at Highway 400 and County Road 88 ■ Several individuals provided suggestions on interchange locations and design, specifically at Bathurst Street, Leslie Street, Yonge Street and County Road 4 ■ Support provided for the Highway 400 Interchange Alternative Refinement 3, Highway 404 Interchange Alternative Refinement 1 and 3, Bathurst Street Interchange Alternative 2, and Holland River East Branch Crossing Refinement Alternative 2 ■ A few individuals suggested including an interchange at 10th Sideroad. 	<ul style="list-style-type: none"> ■ Acknowledgement for the support and suggestions provided and confirmation that they will be considered during the interchange alternatives evaluation ■ Details provided on the interchange locations and alternatives design. ■ Support / recommendations acknowledged with a note that they will be factored into evaluation criteria, where appropriate ■ Noted that a traffic demand analysis has been undertaken as part of this project, which confirmed the locations of the interchanges and traffic modelling.

Comment Theme	Summary of Comments Received	Project Team Response
Environmental Assessment Process	<ul style="list-style-type: none"> ■ Two individuals requested that all applicable land use policies are followed, including policies set out in the Lake Simcoe Protection Plan, the Greenbelt Plan, and the Provincial Policy Statement ■ Several individuals requested clarification on the affect of the proposed project exceptions to the environmental assessment process ■ One individual requested to know if project deliverables will be submitted to Lake Simcoe Region Conservation Authority or Nottawasaga Valley Conservation Authority for voluntary review ■ Several individuals expressed concern regarding the environmental assessment process and noted that the environmental assessment is out of date. 	<ul style="list-style-type: none"> ■ Provided confirmation that the impact assessments undertaken as part of this project will follow appropriate policies/legislations and several provincial and federal regulatory agencies will be consulted ■ Confirmation that, at the time of Public Information Centre #1, the proposed Ministry of the Environment, Conservation, and Parks' exemption was being considered by the Ministry of the Environment, Conservation, and Parks, but environmental impact assessments and required consultation with Indigenous communities and other stakeholders will be completed regardless of the outcome. ■ Confirmation that Lake Simcoe Region Conservation Authority and Nottawasaga Valley Conservation Authority comments and consideration for the design/engineering refinements and approaches to mitigation will be implemented ■ Confirmation that 15 environmental studies are being undertaken as part of the project in accordance with the Regulation. Impact assessments undertaken as part of the project will follow appropriate policies/legislations and several provincial and federal regulatory agencies will be consulted throughout the project.
General Project and Proposed Alignment	<ul style="list-style-type: none"> ■ A few individuals provided support for the project ■ A few individuals requested consistency for the name of the project (Bradford Bypass vs. 400-404 Link) ■ Two individuals inquired about the Bradford Bypass being a toll highway ■ One individual requested information on where the alignment begins in relation to Queensville Sideroad ■ Concerns regarding impacts to recreational canoeing, kayaking and boating ■ Several individuals noted they do not support the Bradford Bypass ■ One individual noted that the COVID-19 pandemic has changed the needs in the region and the Bradford Bypass is no longer needed ■ One individual expressed concern about littering and asked what is being done to prevent littering ■ One individual suggested including a property in the project Study Area in order to reduce traffic congestion ■ Several individuals provided suggestions on the Bradford Bypass alignment ■ One individual requested information on the materials that will be used to build the Bradford Bypass. 	<ul style="list-style-type: none"> ■ Support for the project acknowledged ■ Confirmation that at the time of Public Information Centre #1, an official name or highway designation had not been selected ■ Confirmation that at the time of Public Information Centre #1, decisions regarding tolls have not been made ■ Provision of links to the Project Website showing project mapping and alignment ■ Confirmation that consultation with Transport Canada is ongoing regarding navigation requirements ■ Explanation that the Bradford Bypass is required to help address road congestion and improve connectivity in the Greater Golden Horseshoe ■ Confirmation that littering is prohibited under the Highway Traffic Act and the Ministry has contractors to remove litter along freeways ■ Recommendations acknowledged and a note that suggestions will be factored into the evaluation criteria, where appropriate ■ Rationale provided for the location of the Bradford Bypass highway alignment following evaluations of alternate locations undertaken during the 2002 Approved Environmental Assessment ■ Noted that the Ministry is continually searching for innovative engineering opportunities for highway design/construction materials.

4.6.2 Public Consultation: Preliminary Design Interchange Considerations

A consultation event referred to as the Preliminary Design Interchange Considerations Consultation Event was held for the project between April and May 2022. The purpose of the consultation event was to present updated information on the Preliminary Design Interchange Considerations at 10th Sideroad and 2nd Concession Road, solicit feedback and comments on the additional interchange design alternatives, provide updates on key objectives, and provide an update on project milestones and next steps.

The Preliminary Design Interchange Considerations were posted virtually through the Project Website so interested persons were able to learn more about the additional interchanges for the project.

The materials included updated information for the project, key objectives, and Preliminary Design alternatives for the interchanges at 10th Sideroad and 2nd Concession Road. Materials were made available for a two-week public consultation review period on the Project Website between April 21, 2022, and May 5, 2022.

4.6.2.1 Engagement Materials

The Preliminary Design Interchange Considerations Consultation Event was undertaken as a virtual event as there were limitations on in-person gatherings and events at the time of the event. The display panels presented as part of the event included the following information:

- Project Introduction
- Key Objectives
- How to Participate
- Project History
- Interchange Considerations (what we heard; what we are doing)
- Technically Preferred Route and Interchanges under Consideration
- Study Process
- Evaluation Criteria and Process
- Environmental Protection and Mitigation Measures
- Interchange Alternatives: 10th Sideroad Base Case
- 10th Sideroad Preliminary Design Interchange Options
 - 10th Sideroad Interchange – Alternative 1
 - 10th Sideroad Interchange – Alternative 2
 - 10th Sideroad Interchange – Alternative 3

- Key Considerations
- Summary: Interchange Design Preference for 10th Sideroad
- Interchange Alternatives: 2nd Concession Road
- 2nd Concession Road Base Case
- 2nd Concession Road Preliminary Design Interchange Options
- 2nd Concession Road Interchange – Alternative 1
- 2nd Concession Road Interchange – Alternative 2
- 2nd Concession Road Interchange – Alternative 3
- Key Considerations
- Summary: Interchange Design Preference 2nd Concession Road
- Feedback and Comments
- Project Milestones and Next Steps.

After stakeholders had an opportunity to review the above presentation materials they were encouraged to complete a Comment Form to provide feedback on the interchange alternatives proposed at 10th Sideroad and 2nd Concession Road. The comments included the following:

1. Does your organization wish to participate in the study and continue to receive notices of project activities or information as this study progresses?
If you do not wish to participate, you will be removed from the mailing list
2. Please provide your feedback on the interchange alternatives that will be designed for 10th Sideroad and 2nd Concession Road.

Materials from the Preliminary Design Interchange Consultation Event are provided in **Appendix B** of this Report.

4.6.2.2 Summary of Feedback Received

Data identified that 99 individuals visited the Preliminary Design Interchange Considerations Consultation Event webpage between April 21, 2022 and May 5, 2022. The following section highlights the key findings and level of public interest related to topics / questions identified through the consultation event. The following seven topics emerged from the feedback and comments received:

- Natural Hazards and Environmental Features
- 10th Sideroad Interchange
- 2nd Concession Road Interchange
- Cultural Heritage and Archaeological Impacts

- General Project Alignment and Interchanges
- Property Impacts
- Public Consultation Event.

Table 4-6 summarizes the key questions, comments, issues, and concerns raised during the Preliminary Design Interchange Considerations Consultation Event and the Project Team's response. Prepared responses are being issued directly to the commenter via email.

A copy of the Public Consultation: Preliminary Design Interchange Considerations Summary Report is provided in **Appendix B** of this Report.

Table 4-6: Summary of Feedback Received from Public Consultation: Preliminary Design Interchange Considerations

Comment Theme	Summary of Comments Received	Project Team Response
<p>Natural Hazards and Environmental Features</p>	<ul style="list-style-type: none"> ■ Lake Simcoe Region Conservation Authority provided information about the location of floodplain and erosion hazards, environmental features (e.g., significant woodlands, ecologically significant groundwater recharge areas, etc.) and mapping at the proposed interchanges at 10th Sideroad and 2nd Concession Road. ■ Provided a list of suggested avoidance and mitigation measures. ■ Recommended further consultation through the Detail Design or environmental discipline studies which will be carried out through the design including: <ul style="list-style-type: none"> - Drainage and Hydrology; - Floodplain Studies; - Erosion and Sediment Control; - Fish and Fish Habitat Existing Conditions and Impact Assessment Report; - Fluvial Geomorphology; - Groundwater Impact Assessment; - Landscape Plan; - Environmental Impact Studies; - Engineered Drawings - Grading Plans 	<ul style="list-style-type: none"> ■ Thank you for providing comments on behalf of Lake Simcoe Region Conservation Authority. The Preliminary Design for the Bradford Bypass project is still underway and will complete several comprehensive studies related to the natural, socio-economic, cultural environment, and engineering design. These studies will update and document existing conditions, identify and evaluate potential impacts of the project and recommend mitigation measures to reduce these impacts to meet current environmental legislative requirements. For stormwater management controls, the project will follow the Ministry of the Environment, Conservation and Parks Stormwater Management guidelines, and will consider Lake Simcoe Region Conservation Authority guidelines where appropriate. ■ Thank you for providing the information on natural hazards, environmental features, and mapping at the proposed interchanges, as well as the list of suggested avoidance and mitigation measures. We have circulated this information to the appropriate technical disciplines for consideration of project-specific environmental impacts. Additionally, the location of the natural hazards and environmental features identified at 10th Sideroad and 2nd Concession Road will also be documented and taken into consideration as part of these studies. Thank for further clarification on the HEC-RAS modelling information. This analysis is being carried out as discussed at the February 17, 2022 meeting with Lake Simcoe Region Conservation Authority. ■ The results of these studies will be presented during the next Public Information Centre (PIC) #2 anticipated to be held during the fall of 2022 and documented in a Draft Environmental Conditions Report and draft Environmental Impact Assessment Report, to be prepared in accordance with the Regulation. ■ The Project Team will continue to consult with the Lake Simcoe Region Conservation Authority and environmental agencies throughout the Preliminary Design. In accordance with the Regulation, Lake Simcoe Region Conservation Authority will receive copies of the draft Groundwater Protection and Well Monitoring Plan, draft Stormwater Management Plan, Draft Environmental Conditions Report and Draft Environmental Impact Assessment Report for review. Following Preliminary Design, the Ministry will continue to consult with Lake Simcoe Region Conservation Authority for Detail Design and construction.
<p>Support of 10th Sideroad Interchange</p>	<ul style="list-style-type: none"> ■ Expressed support for the 10th Sideroad interchange and noted it is essential to balance the local traffic in the Town of Bradford. 	<ul style="list-style-type: none"> ■ The Project Team acknowledges and appreciates your support for the proposed interchange at 10th Sideroad. We have added you the project contact list and you will be notified through email of future milestone events including the filing of the Environmental Conditions Report, Public Information Centre #2, filing of the Environmental Impact Assessment Report and other updates for this study. An Ontario Government Notice announcing the date of the future Public Information Centre will be published in local newspapers, posted on the Project Website, and distributed via Canada Post Unaddressed Admail to residences and businesses adjacent to the Study Area. Stakeholders on the project contact list will receive direct notification through mail or email.

Comment Theme	Summary of Comments Received	Project Team Response
<p>Needs justification at 2nd Concession Road</p>	<ul style="list-style-type: none"> Requested details and asked for clarification on justification and need for an interchange at 2nd Concession Road. 	<ul style="list-style-type: none"> The Bathurst Street and Leslie Street interchanges were identified in the 2002 Approved Environmental Assessment which was developed, evaluated, and selected through that evaluation process. The Ministry is developing and considering the feasibility of interchanges at 10th Sideroad and 2nd Concession Road as part of the Preliminary Design based on feedback received from municipalities in 2020. It was requested that interchanges be considered at these locations based on municipal and regional development and transportation planning within Simcoe County and York Region. For each interchange, configuration options are also being considered as shown in the materials for the Preliminary Design interchange considerations for 10th Sideroad and 2nd Concession Road on the Project Website (https://www.bradfordbypass.ca/wp-content/uploads/2022/04/2022-21-04_MTG-PublicConsultationInterchanges.pdf). The interchanges will be evaluated through a reasoned-argument method to consider the five broad factors: Transportation, Natural Environment, Social Environment, Economic Environment, and Cultural Environment. Your feedback, along with others received through consultation, will be incorporated into the evaluation as part of these factors. The interchange evaluation will consider highway geometrics, traffic modelling, and structural and environmental factors.
<p>2nd Concession Road Interchange</p>	<ul style="list-style-type: none"> Opposed the proposed interchange at the 2nd Concession Road and deemed it excessive on a rural residential road. Noted that anyone from this area wanting to access the Bradford Bypass could just as easily do so from the 404 via either Green Lane or Queensville Road and another interchange to come at Doane Road. 	<ul style="list-style-type: none"> The Ministry is developing and considering the feasibility of interchanges at 10th Sideroad and 2nd Concession Road as part of the Preliminary Design based on feedback received from municipal staff and councils in 2020. Through consultation with York Region and the local municipalities, it has been requested that the Ministry specifically consider including an interchange at 2nd Concession Road based on municipal and regional development and transportation planning. Since the 2002 approved Environmental Assessment, the Region has continued to update their Transportation Master Plan and consider future planning improvements to 2nd Concession Road. The Ministry is evaluating the interchanges considering five broad factors for the selection of the interchange design for the Bradford Bypass, including: Transportation, Natural Environment, Social Environment, Economic Environment, and Cultural Environment. The Project Team will continue to consult with and work closely with the municipalities throughout design and construction to co-ordinate municipal road improvements with the Bradford Bypass. The preferred interchange configuration at 2nd Concession Road will be presented at Public Information Centre #2, which will highlight the overall preferred Preliminary Design.
<p>Support for 2nd Concession Road Interchange</p>	<ul style="list-style-type: none"> Phoned to express support for interchange at 2nd Concession Road and noted this proposed interchange is long overdue. 	<ul style="list-style-type: none"> Project Team received the phone call and appreciated support for the project.

Comment Theme	Summary of Comments Received	Project Team Response
<p>Cultural Heritage and Archaeological Impacts</p>	<ul style="list-style-type: none"> Archaeology and cultural heritage comments from the Ministry of Citizenship and Multiculturalism regarding decision making for the design and selection of alternatives when comparing the impacts of different interchange configurations and locations. 	<ul style="list-style-type: none"> The Project Team is updating the Stage 1 Archaeological Assessment report to address Ministry of Citizenship and Multiculturalism’s comments. Through the Preliminary Design, the Ministry continues to complete Stage 2 Archaeological Assessments. The results of these assessments will include any archaeological findings for the interchanges at 10th Sideroad and 2nd Concession Road and will be documented in Stage 2 Archaeological Assessment Report(s) for the project. Based on the findings of the Stage 2 investigations, the Ministry will advance Stage 3 and Stage 4 investigations, with involvement from Indigenous communities. The archaeological assessment documentation will be provided to Indigenous communities for review and consideration, then submitted to the Ministry of Citizenship and Multiculturalism for review and acceptance. The Project Team consulted with Ministry of Citizenship and Multiculturalism regarding the Cultural Heritage Resource Assessment Report prepared in 2020. The 2020 Cultural Heritage Resource Assessment Report for the Bradford Bypass is being revised to reflect comments and discussions with Ministry of Citizenship and Multiculturalism. The revised Cultural Heritage Resource Assessment Report will include a field review and will be updated in accordance with Ministry of Transportation’s cultural heritage conservation policy and procedures and in consideration of the Ministry of Citizenship and Multiculturalism comments received on February 11, 2022. The updated report covers the Preliminary Design, including the proposed interchanges at 10th Sideroad and 2nd Concession Road. Once complete, the revised Cultural Heritage Resource Assessment Report will be resubmitted to the Ministry of Citizenship and Multiculturalism. Both archaeology assessments and cultural heritage evaluations are ongoing for the project. The results of these studies will be documented in corresponding reports. For archaeology, updated Stage 1, and new Stage 2, 3 and 4 archaeology reports will be prepared, where required, and submitted to the Ministry of Citizenship and Multiculturalism. For Cultural Heritage, the Cultural Heritage Resource Assessment Report will be updated, and resource-specific Cultural Heritage Evaluation Reports and Heritage Impact Assessment Reports will be prepared, where required. Findings will be factored into the evaluation of the Preliminary Design alternatives and a summary of the studies will be presented in the fall of 2022 at the next Public Information Centre #2 and documented in both the Environmental Conditions Report and the Environmental Impact Assessment Report, in accordance with the Regulation.
<p>Against the Interchanges and Project</p>	<ul style="list-style-type: none"> Opposed the project and noted that five interchanges in addition to the ones at Highway 400 and Highway 404 seem excessive and land intensive. 	<ul style="list-style-type: none"> The Ministry is developing and considering the feasibility of interchanges at 10th Sideroad and 2nd Concession Road as part of the Preliminary Design based on feedback received from municipal staff and councils in 2020. It was requested that interchanges be considered at these locations based on municipal and regional development and transportation planning within Simcoe County and York Region. For each interchange, configuration options are also being considered as presented in the interchange consultation material. The interchanges will be evaluated through a reasoned-argument method to consider the five broad factors: Transportation, Natural Environment, Social Environment, Economic Environment, and Cultural Environment. Your feedback, along with others received through consultation, will be incorporated into the evaluation as part of these factors. The interchange evaluation will also consider highway geometrics, traffic modelling, and structural and environmental factors.

Comment Theme	Summary of Comments Received	Project Team Response
<p>Feedback on the new Interchanges</p>	<ul style="list-style-type: none"> ■ Provided feedback on the 10th Sideroad Interchange and design configurations in order to minimize property impacts ■ Provided design configuration feedback on the 2nd Concession Road given current and future traffic volumes 	<ul style="list-style-type: none"> ■ The Ministry is developing and considering the feasibility of interchanges at 10th Sideroad and 2nd Concession Road as part of the Preliminary Design based on feedback received from municipal staff and councils in 2020. It was requested that interchanges be considered at these locations based on municipal and regional development and transportation planning within Simcoe County and York Region. Interchange configuration refinements at the proposed locations within the Study Area are being considered based on five broad factors: Transportation, Natural Environment, Social Environment, Economic Environment, and Cultural Environment. Each design alternative presented was developed to meet highway standards such as sight distance, weaving distance, and other governing criteria. The Project Team considers the design standards in a balanced approach to other constraints, including property impacts. ■ Your feedback aligns with the Ministry's plans for evaluating interchange design, and will be taken into consideration, along with other feedback received, for evaluation of the interchange alternatives for 10th Sideroad and 2nd Concession Road, and future design refinements.
<p>Support for Bathurst Street Interchange</p>	<ul style="list-style-type: none"> ■ Expressed support for the interchange at Bathurst. 	<ul style="list-style-type: none"> ■ The Project Team acknowledges and appreciates your expressed support for the Bathurst Street interchange. We have added you to the Project Contact List and you will be notified through email of future milestone events including the filing of the Environmental Conditions Report, Public Information Centre #2, filing of the Environmental Impact Assessment Report and other updates for this study. An Ontario Government Notice announcing the date of the future Public Information Centre will be published in local newspapers, posted on the Project Website, and distributed via Canada Post Unaddressed Admail to residences and businesses adjacent to the Study Area. Stakeholders on the Project Contact List will receive direct notification through mail or email.
<p>Property Impacts</p>	<ul style="list-style-type: none"> ■ Expressed concern for property impacts and noted the location of the future York Region Water Reclamation Centre site. ■ Requested further clarity on residual land use capability and the location of driveway entrances, specifically for 21024 and 21045 2nd Concession Road. 	<ul style="list-style-type: none"> ■ Your feedback will be taken into consideration on the interchange design refinements and alternatives presented. Through previous consultation with East Gwillimbury and York Region, the Project Team is aware of the future studies for the Upper York Sewer Solution and appreciates further confirmation of the proposed water reclamation centre on 2nd Concession Road. ■ Property access and modifications to existing entrances will continue to be reviewed as part of the evaluation of alternatives and future construction staging for the project. The Ministry will work with property owners to consider these potential impacts to access and identify where accommodations and access impact mitigations can be implemented. The preferred alternative for the Bradford Bypass will be presented at Public Information Centre #2 scheduled for the fall of 2022. Land use and acquisition (if required) will be determined based on Ministry directives.

Comment Theme	Summary of Comments Received	Project Team Response
<p>General PIS Event Question</p> <p>Opposition to the Project & feedback on design decisions & alternative solutions</p>	<ul style="list-style-type: none"> ■ Questioned why the Interchange Considerations were only available for consideration for a 2-week period (e.g., why not a 30-day review period) given the public has little knowledge about the design and implementation of various interchange configurations. ■ The real question to be consulting on is: Should we add interchanges at 10th Sideroad and 2nd Concession? And if so, are there other interchanges, such as Leslie St, where a proposed interchange can or should be removed? ■ Provided historical and policy context around the Ministry's mandate for addressing the need and justification for building Bedford Bypass in the absence of inter-regional arterial roads. Noted that the Bypass will have significant negative impacts to the natural environment while costing more per kilometre than most highways due to the added costs of building this highway on structurally unsound substrate. Concluded that this highway will also not satisfy the Ministry's original planned objective of separating local from long distance travel. ■ Strongly recommended that the travel demands to be generated in this area be served by arterial roads connecting existing roads on either side of the Holland River. These would be located to connect Bradford's 8th Line with Queensville Sideroad via Hochreiter Rd. and Bathurst St. and immediately south of Cook's Bay connecting Ravenshoe Rd. to Hwy 89 via Line 13 and 20th Sideroad. ■ Recommended that a controlled access highway to link Highways 400 with 404 would be built south of Newmarket along one of the "Outer Ring Road" routes depicted on the Ministry's Exhibit E-5 to their 2002 Approved Environmental Assessment. 	<p>Consultation Process – Interchange Consultation Event</p> <ul style="list-style-type: none"> ■ The Preliminary Design Interchange Considerations Event materials were available for a two-week review period, in place of a one day in-person event. This was intended to allow people the flexibility to review the information at any time between April 21 and May 5, 2022. While this was the focused duration of the event to be considered as part of the evaluation, the materials remain on the Project Website and comments can be submitted at anytime during the study. <p>Interchange Design and Location Evaluations</p> <ul style="list-style-type: none"> ■ Thank you for your question and personal insight into the evaluation process. This is consistent with the evaluation process that the Project Team is currently undertaking. As part of the Route Planning Study, interchanges were considered at each major road crossing. In consultation with local municipalities and regional government representatives during the current Preliminary Design study, it has been requested that the Ministry reconsiders options to provide these two interchanges based on current transportation master planning and municipal planning efforts. ■ the Ministry will evaluate the feasibility of interchanges at 10th Sideroad and 2nd Concession Road as part of the Preliminary Design and continue to engage with local municipalities and regional government representatives throughout the study. <p>Preliminary Design Study and Process</p> <ul style="list-style-type: none"> ■ The Bradford Bypass was proposed as one part of the response to this dramatic growth in population and travel demand in the area and to the forecasted increase in congestion on key east-west roadways linking Highway 400 to Highway 404. The Technically Preferred Route was selected based on highway network expansion, ease of construction, relationship to provincial and municipal land use planning (Official and Transportation Master Plans, Places to Grow Act), as well as having fewer negative impacts to residential and natural areas when compared to other route options. ■ Through the study, traffic modelling is carried out to evaluate potential alternatives with respect to traffic demand and level of service. This information is considered along with the evaluation of design, environmental, social, and cultural criteria. Geotechnical investigations are part of the structural design of the bridges and highway design to understand the foundational requirements of the project. The local municipalities and regional governments continue to review and update their transportation master plans to reflect local transportation needs and provide recommendations and planning for roadway improvements within their jurisdiction. Alternatives that involve municipal and regional transportation planning for non-provincial roadways are beyond the scope of considerations for this project.
<p>10th Sideroad Interchange</p>	<ul style="list-style-type: none"> ■ Expressed preference for Alternative #2 as it limits the number of properties required compared to Alternative #1 and provided design configuration feedback for a pedestrian sidewalk under the Bypass to access Henderson Park which will be a large community park. 	<ul style="list-style-type: none"> ■ Thank you for advising us of your preference for Alternative #2. The Project Team will continue to consult with you and other property owners along the right-of-way throughout design and construction with respect to potential property impacts and appropriate mitigation opportunities. If you wish to meet with the Project Team to discuss your property-specific concerns as it relates to the design, please let us know and we can arrange a time to meet with you.

4.7 Correspondence and Issues Tracking

This section summarizes the record of comments, feedback, communications received during the study, and corresponding responses with Indigenous communities, agencies, municipalities, key stakeholders and the public. An updated summary of correspondence and issues tracking will be included in the Environmental Impact Assessment Report, reflective of the ongoing consultation and engagement for the project.

4.7.1 Correspondence with Indigenous Communities

Table 4-7 summarizes all correspondence with Indigenous communities and the Project Team's response. Prepared responses were issued directly to the Indigenous community via email. All correspondence records with Indigenous communities until May 31, 2022 are provided in **Appendix B** of this Report.

Table 4-7: Summary of Correspondence with Indigenous Communities

Indigenous Community	Comment Date	Summary of Comments Received	Project Team Response or Information Conveyed in the Correspondence
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	September 23, 2020	<ul style="list-style-type: none"> ■ Not Applicable. 	<ul style="list-style-type: none"> ■ Notice of Study Commencement sent via mail and email.
Huron-Wendat Nation	September 30, 2020	<ul style="list-style-type: none"> ■ Huron-Wendat Nation acknowledged receipt of the Notice of Study Commencement for the Bradford Bypass ■ Huron-Wendat Nation requested to be engaged with further archaeological studies that are initiated as part of the project ■ Huron-Wendat requested a copy of the Stage 1 Archaeological Assessment Report. 	<ul style="list-style-type: none"> ■ The Project Team acknowledged Huron-Wendat Nation's response ■ The Project Team provided a digital copy of the archaeological assessment and noted it was completed by the Ministry in 2020 in advance of the Preliminary Design ■ The Project Team noted they look forward to engaging with Huron-Wendat Nation and to reach out with further questions or meeting requests.
Huron-Wendat Nation	November 4, 2020	<ul style="list-style-type: none"> ■ Huron-Wendat Nation requested a meeting with the Project Team and asked the Project Team to provide possible meeting dates. 	<ul style="list-style-type: none"> ■ The Project Team noted they will confirm the Ministry's availability and provide Huron-Wendat Nation with potential meeting dates ■ The Project Team provided three possible meeting dates and asked which dates work for Huron-Wendat Nation attendees.
Huron-Wendat Nation	November 10, 2020	<ul style="list-style-type: none"> ■ Huron-Wendat Nation provided their preference on a meeting date and time. 	<ul style="list-style-type: none"> ■ A meeting was held on December 2, 2020.
Curve Lake First Nation	February 2, 2021	<ul style="list-style-type: none"> ■ Curve Lake First Nation acknowledged receipt of the Notice of Study Commencement for the Bradford Bypass with a letter dated November 23, 2020 ■ Curve Lake First Nation requested to be kept informed throughout the duration of the project 	<ul style="list-style-type: none"> ■ The Project Team provided a summary of the project and studies that will be undertaken ■ Offered opportunities to schedule meetings to describe the process and for Curve Lake First Nation to discuss any concerns.
Hiawatha First Nation	February 8, 2021	<ul style="list-style-type: none"> ■ Hiawatha First Nation requested to review the Environmental Assessment for the project, and noted that they have not been provided any additional information on the project or consultation with Williams Treaty communities. 	<ul style="list-style-type: none"> ■ The Project Team thanked the Hiawatha First Nation for their interest in the project and noted that their request has been forwarded to the appropriate parties and a response will be provided as soon as possible ■ The Project Team encouraged Hiawatha First Nation to visit the Project Website to review project information.
Huron-Wendat Nation	February 22, 2021	<ul style="list-style-type: none"> ■ Huron-Wendat Nation noted that they have not received an update on the next steps for the archaeological studies for the project, and requested to know if archaeological studies are being pursuing in 2021. 	<ul style="list-style-type: none"> ■ The Project Team noted that they will confirm the details of the upcoming field season and provide a response ■ The Project Team provided digital copies of the archaeological assessment completed in 2020.

Indigenous Community	Comment Date	Summary of Comments Received	Project Team Response or Information Conveyed in the Correspondence
Mississaugas of Scugog Island First Nation	November 19, 2020	<ul style="list-style-type: none"> ■ Mississaugas of Scugog Island First Nation confirmed receipt of the Notice of Study Commencement ■ Mississaugas of Scugog Island First Nation noted that their Consultation Specialist has reviewed the Notice of Study Commencement and has no comments, as the project is occurring in the Territory of the Chippewas ■ Mississaugas of Scugog Island First Nation asked to be kept informed throughout the duration of the project ■ Mississaugas of Scugog Island First Nation provided contact details for their Communications Specialist. 	<ul style="list-style-type: none"> ■ The Project Team acknowledged Mississaugas of Scugog Island First Nation's response and thanked them for their interest in the project ■ The Project Team encouraged Mississaugas of Scugog Island First Nation to visit the Project Website to review project information ■ The Project Team noted they look forward to engaging with Mississaugas of Scugog Island First Nation and to reach out with further questions or meeting requests.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	April 13, 2021	■ Not Applicable.	■ Notice of Public Information Centre #1 was sent via mail and email.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	January 7, 2022	■ Not Applicable.	■ A Notice of Publication of Draft Early Works Report was sent via mail and email.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	March 21, 2022	■ Not Applicable.	■ A Notice of Publication of Final Early Works Report was sent via mail and email.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	April 14, 2022	■ Not Applicable.	■ A Notice of Consultation: Preliminary Design Interchange Considerations was sent via mail and email.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	July 28, 2022 (August 12, 2022)	■ Not Applicable.	<ul style="list-style-type: none"> ■ A Notice of Publication of Draft Environmental Conditions Report was sent via mail and email. ■ A revised Notice of Publication of Draft Environmental Conditions Report was sent via email on August 12, 2022, with follow up by mail.
Alderville First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat Nation, Kawartha Nishnawbe First Nation, Métis Nation of Ontario - Georgian Bay Métis Council, Mississaugas of Scugog Island First Nation	October 27, 2022	■ Not Applicable.	■ A Notice of Publication of Final Environmental Conditions Report was sent via mail and email.

4.7.2 Stakeholder and Public Correspondence

Table 4-8 summarizes the key questions, comments, issues, and concerns raised by stakeholders and the public, and the Project Team's response. Prepared responses were issued directly to the individual via email. All correspondence records with stakeholders and the public until May 31, 2022 are provided in **Appendix B** of this Report.

Table 4-8: Summary of Public and Stakeholder Correspondence

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Government Agencies	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> The Ministry of Natural Resources and Forestry requested to continue to receive information and environmental reports from the Project Team Transport Canada requested to only receive project notifications if it impacts federal properties or waterways The Ontario Federation of Agriculture requested to be added to the Project Contact List Enbridge Gas provided updated contact information. Fisheries and Oceans Canada requested contact information for Project Team members to send consultation packages to. Impact Assessment Agency of Canada requested to be removed from the Project Contact List. 	<ul style="list-style-type: none"> Confirmation that Ministry of Natural Resources and Forestry will continue to receive updates, and environmental reports will be provided for review Confirmation that Transport Canada will receive project notifications specific to federal property impacts and waterways, and requesting contact information for Navigation Protection Program Staff Provision of information on the upcoming Public Information Centre #1 and confirmation that Ontario Federation of Agriculture has been added to the Project Contact List Confirmation that the Project Team has updated Enbridge Gas contact information. Provided contact information for members of the Project Team. Confirmation that the Impact Assessment Agency of Canada has been removed from the Project Contact List.
Government Agencies	<ul style="list-style-type: none"> Environmental Concerns- Natural Environment 	<ul style="list-style-type: none"> Fisheries and Oceans Canada provided their comments and mitigation measures on the Stormwater Management Plan for the County Road 4 Early Works. 	<ul style="list-style-type: none"> Confirmation Fisheries and Oceans Canada's suggested mitigation measures will be provided to the contractor for the Detail Design.
Government Agencies	<ul style="list-style-type: none"> Environmental Concerns – Social and Economic Environment 	<ul style="list-style-type: none"> The Ontario Ministry of Agriculture, Food and Rural Affairs noted the project may impact agricultural areas, including speciality crop areas, and requested to review a draft of the Agricultural Impact Assessment The Ministry of Economic Development, Job Creation and Trade expressed concern regarding impacts to transport and logistics as a result of lane closures and detours The Ministry of Citizenship and Multiculturalism requested information on the archaeological resources, and built heritage resources assessed as part of the project. 	<ul style="list-style-type: none"> Confirmation that consultation with Ontario Ministry of Agriculture, Food and Rural Affairs and local farming communities are ongoing, and an Agriculture Impact Assessment will be completed in accordance with Ontario Ministry of Agriculture, Food and Rural Affairs' Draft Agriculture Impact Assessment Guidance Document (2018), and provided to the Ontario Ministry of Agriculture, Food and Rural Affairs for review Confirmation that the Project Team will work with municipalities and stakeholders to minimize travelling impacts during all phases of the project Confirmation that a Stage 1 Archaeological Assessment Report and a Project Information Form for Stage 2 Archaeological Assessment work (P123-0454-2020) for the project are underway and will be shared with Ministry of Citizenship and Multiculturalism for review Confirmation that a Cultural Heritage Resource Assessment Report was prepared during a pre-work retainer assignment which identified a number of cultural resources. The Project Team noted that further built / cultural heritage work may be undertaken as the Preliminary Design progresses.
Government Agencies	<ul style="list-style-type: none"> Engineering, Transportation and Design 	<ul style="list-style-type: none"> Hydro One confirmed the locations of high voltage transmission facilities within the Study Area, and requested the facilities be completely avoided or provide enough time to relocate. 	<ul style="list-style-type: none"> Confirmation the Project Team is reviewing Hydro One's existing facilities network to avoid or mitigate infrastructure and requested available information for Hydro One's future lines or secondary uses. The Project Team confirmed that consultation with Hydro One regarding infrastructure interactions with the project is ongoing through regular meetings.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Government Agencies	<ul style="list-style-type: none"> General Project and Proposed Alignment 	<ul style="list-style-type: none"> Infrastructure Ontario requested the Ministry to verify if there are any impacted provincial government properties within the Study Area The Impact Assessment Agency of Canada noted they have received numerous public correspondence expressing concerns regarding the project, including requests to reconsider the project's designation under the Impact Assessment Act. Impact Assessment Agency of Canada provided copies of the correspondence received and encouraged the Project Team to add the individuals to the Project Contact List. 	<ul style="list-style-type: none"> Confirmation that Ministry will inform Infrastructure Ontario if any government land (non-Ministry owned land) will be required for the project The Ministry responded with a letter to Impact Assessment Agency of Canada.
Municipal	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> Several municipal staff members requested to be added to the Project Contact List. Town of Bradford West Gwillimbury Fire and Emergency Services requested updating the Project Contact List to reflect new staff. 	<ul style="list-style-type: none"> Acknowledgement provided and contacts were added to the Project Contact List. Confirmation the Project Contact List has been updated to reflect new Town of Bradford West Gwillimbury Fire and Emergency staff.
Municipal	<ul style="list-style-type: none"> Environmental Concerns – Natural Environment 	<ul style="list-style-type: none"> Nottawasaga Valley Conservation Authority noted the project Study Area is within an area regulated by the Nottawasaga Valley Conservation Authority and is therefore subject to Ontario Regulation 172/06, and provided suggestions regarding stormwater management, hydraulics, erosion and sediment control and restoration Nottawasaga Valley Conservation Authority noted that the western-most interchange falls within Nottawasaga Valley Conservation Authority's jurisdiction in which the footprint falls within one or more tributaries of Penville Creek. Nottawasaga Valley Conservation Authority noted that there are agriculture lands and / or cultural environments adjacent to the existing Highway 400 may serve as a habitat for one or more Species at Risk. Nottawasaga Valley Conservation Authority noted that further details may be required regarding encroachment into regulated features Nottawasaga Valley Conservation Authority noted the footprint of the proposed interchange for Highway 400 overlaps the existing alignment of one or more tributaries of Penville Creek Lake Simcoe Region Conservation Authority noted the study area falls within areas government by Ontario Regulation 179/06, and noted there are woodlands and wetlands that should be examined. Lake Simcoe Region Conservation Authority noted that they would like to set up a meeting with the Project Team to discuss the project and Memorandums of Understanding of member municipalities The Ministry of Natural Resources and Forestry provided input regarding Provincially Significant Wetlands and natural heritage features, following a meeting with regulatory agencies on March 9, 2022 in which the Ministry of Natural Resources and Forestry were unable to attend. 	<ul style="list-style-type: none"> Acknowledgement of Nottawasaga Valley Conservation Authority's comments, confirmation that the Project Team is conducting a number of environmental studies. Project Team confirmed that Nottawasaga Valley Conservation Authority will be consulted throughout the project Directed Lake Simcoe Region Conservation Authority to the Project Website to view the full list of environmental studies being conducted as part of the project, and asked for Lake Simcoe Region Conservation Authority drainage modelling to be provided in order to complete drainage analysis Thanked the Ministry of Natural Resources and Forestry for providing input.
Municipal	<ul style="list-style-type: none"> Environmental Concerns – Social and Economic Environment 	<ul style="list-style-type: none"> The Town of Bradford West Gwillimbury noted manufacturers and companies associated with transportation, logistics, and distribution are in favour of the project, and the Town would like to provide them with updates. 	<ul style="list-style-type: none"> Confirmation that the Town of Bradford West Gwillimbury is on the Project Contact List and will continue to receive updates which can be relayed to the businesses. Alternatively, businesses can request to be added to the Project Contact List.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Municipal	<ul style="list-style-type: none"> Engineering, Transportation and Design 	<ul style="list-style-type: none"> The Town of Bradford West Gwillimbury noted that the Holland River is used as a legal outlet for municipal drains under the Ontario Drainage Act, and designs that will not impede on hydrological capacities or function should be considered The Town of Bradford West Gwillimbury inquired about design details at Artesian Industrial Parkway specifically regarding sewers and pipes. York Region noted the project may impact existing or future underground water and wastewater infrastructure. King Township asked if the Early Works included intersection improvements and signalling at 9th Line and Country Road 4. 	<ul style="list-style-type: none"> Confirmation that the Ministry will conduct Hydrology and Drainage Assessment and an Erosion and Sediment Control Risk Assessment Acknowledgement of future utility crossings at the project to service proposed developments in the vicinity of Artesian Industrial Parkway Confirmation the Project Team will consult with York Region to identify and avoid where possible existing and future facilities as the design progresses Provision of links to available information on the Project Website Confirmation that improvements to the 9th Line intersection are not part of the Ministry's scope of work.
Municipal	<ul style="list-style-type: none"> Project Planning and Timelines 	<ul style="list-style-type: none"> The Town of East Gwillimbury requested confirmation that the project is included in Ontario's 2021 Budget and if that budget will fund the Environmental Assessment and Preliminary Design. The Town requested information on the budget for Detail Design and construction phases. 	<ul style="list-style-type: none"> Meeting held on March 30, 2021 with municipalities discussing funding.
Municipal	<ul style="list-style-type: none"> Interchange Locations and Design 	<ul style="list-style-type: none"> The Town of Bradford West Gwillimbury requested an interchange at 10th Sideroad and noted no concerns with the proposed interchange at County Road 4 / Yonge Street. 	<ul style="list-style-type: none"> Acknowledgement of request for an interchange at 10th Sideroad Acknowledgement of no concerns with interchange at County Road 4.
Municipal	<ul style="list-style-type: none"> Environmental Assessment Process 	<ul style="list-style-type: none"> The York Region requested clarification on the affect of the proposed project exceptions to the environmental assessment process. 	<ul style="list-style-type: none"> Confirmation that at the time of this correspondence, the Ministry was following the approved planning process for a Group 'A' project under the Ministry of Transportation Class Environmental Assessment for Provincial Transportation Facilities unless there is an exemption.
Municipal	<ul style="list-style-type: none"> General Project and Proposed Alignment 	<ul style="list-style-type: none"> The Town of East Gwillimbury provided a link to a municipal staff memo which discussed the Bradford Bypass Environmental Status Update. The Town of East Gwillimbury noted that it has been provided to Council on April 7, 2021 York Region forwarded to the Project Team the Impact Assessment Agency of Canada's response to the designation request for the project. 	<ul style="list-style-type: none"> Thanked the Town of East Gwillimbury for providing the memo and noted it has been circulated to the broader Project Team.
Interest Group	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> Several individuals requested to be added to the Project Contact List. One individual inquired about providing expertise, comments and suggestions to the Project Team One individual requested the date and timing of Public Information Centre #1 Several individuals requested information on upcoming public consultation events and review periods for the Environmental Assessment One individual noted that they cannot locate a link to register for Public Information Centre #1 and requested to know why Public Information Centre #1 materials will only be available for two weeks. The individual also inquired about what information will be provided at the Public Information Centre #1 	<ul style="list-style-type: none"> Contacts were added to the Project Contact list and acknowledgement provided Confirmation that comments from all stakeholders are encouraged and welcome at anytime Confirmation that Public Information Centre #1 will be held in Spring 2021, and the individual will be notified through email of Public Information Centre #1 and other project updates Details on Public Information Centre #1 provided Confirmation that the two-week period was instituted to gather feedback from stakeholders however the materials will remain on the website and comments are accepted at any time. The Project Team confirmed that results of the environmental studies will be presented at Public Information Centre #2 and a formal response will be provided to each commenter, relating to each specific question

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Interest Group	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> One individual inquired about traffic studies and potential connections with GO Transit. The individual expressed concern about the consultation process and the Environmental Registry of Ontario exemption for the Bradford Bypass, noting that the exemption should be removed for improved public consultation. 	<ul style="list-style-type: none"> Confirmation that the traffic study will be summarized in the Environmental Conditions Report and Environmental Impact Assessment Report, and provision of links for further information on planned GO services. Details provided on the Environmental Registry of Ontario decision for the Bradford Bypass, the Regulation and the County Road 4 Early Works.
Interest Group	<ul style="list-style-type: none"> Environmental Concerns – Natural Environment 	<ul style="list-style-type: none"> One individual requested to know how many acres of farmland will be lost as a result of the project One individual expressed concern about impacts to wetland and forested areas and requested to know if an elevated roadway is under consideration. The individual also requested the western portion of the alignment to be moved further north to avoid impacts to residential communities. 	<ul style="list-style-type: none"> Confirmation that various environmental studies are being undertaken to identify environmental concerns, commitments and mitigation measures, including an Agricultural Impact Assessment and Property Impact Report, and results of assessments will be presented at future Public Information Centres and posted to the Project Website Confirmation that the Preliminary Design will consider minimizing impacts to wetland areas through engineering refinements, and the Ministry continues to engage with regulatory agencies throughout the project.
Interest Group	<ul style="list-style-type: none"> Environmental Concerns – Social and Economic Environment 	<ul style="list-style-type: none"> One individual noted that an elementary school is in the process of being designed on lands adjacent to the Study Area One individual inquired about impacts to properties adjacent to the proposed interchange at Highway 400 and requested to set up a meeting to discuss further project details, providing possible available dates Ontario Federation of Agriculture inquired about an Agricultural Impact Assessment being completed for the project. One individual the Project Information Forms numbers for the Bradford Bypass archaeological reports under Ministry of Citizenship and Multiculturalism’s portal. 	<ul style="list-style-type: none"> Noted that alignment refinements are ongoing, considering existing and approved developments Project Team provided details on the upcoming Public Information Centre #1 and noted that a meeting invite on May 21, 2021 will be provided Confirmation that an Agricultural Impact Assessment will be completed, and consultation with local farming communities and the Ontario Ministry of Agriculture, Farming and Rural Affairs is ongoing. Project Team provided Project Information Forms numbers for the archaeological reports.
Interest Group	<ul style="list-style-type: none"> Engineering, Transportation and Design 	<ul style="list-style-type: none"> One individual requested the bridge heights for the overpass at Holland River East Branch One individual noted that their boat requires a minimum bridge height of 8 metres. 	<ul style="list-style-type: none"> Confirmation that the design of the highway and bridge structures are underway and will take into consideration navigability and maintaining proper access to the Holland River and Holland River East Branch Confirmation that the vessel size will be considered during the design of the bridge structures.
Interest Group	<ul style="list-style-type: none"> Environmental Assessment Process 	<ul style="list-style-type: none"> One individual noted that the Project Website has not been updated to reflect the decision of the Environmental Registry of Ontario on the project. 	<ul style="list-style-type: none"> Details provided on the Environmental Registry of Ontario decision for the Bradford Bypass, the Regulation and the County Road 4 Early Works. A link to the Environmental Registry of Ontario decision was added to the Project Website.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Interest Group	<ul style="list-style-type: none"> General Project and Proposed Alignment 	<ul style="list-style-type: none"> One individual requested to know the financial cost to the taxpayer as a result of the Bradford Bypass, and inquired about travel time reductions between Keswick to Barrie One individual requested to know if the Ministry will proceed with the project prior to determining cost estimates One individual requested a study showing travel time predictions and requested a traffic study to review. Ontario Provincial Police requested to know if they will be monitoring the highway during construction or local police. 	<ul style="list-style-type: none"> Details provided on travel time projections for the project. Project Team noted that details of cost forecasts for the project have not yet been determined and the Ministry only releases costs once the procurement process is complete Confirmation that the 2021 Budget allocated funding for the Early Works, however Ministry is still required to complete an environmental assessment prior to the commencement to the Early Works Details provided regarding rationale for the project including, travel time savings and population projections, and confirmation that a traffic summary will be summarized in the Environmental Conditions Report and Environmental Impact Assessment Report. Confirmation that the Ontario Provincial Police will be monitoring the highway as the proponent is the Ministry.
Elected Officials	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> A representative from the office of Member of Parliament Scot Davidson requested to be added to the Project Contact List. 	<ul style="list-style-type: none"> Contacts were added to the Project Contact list and acknowledgement provided.
Elected Officials	<ul style="list-style-type: none"> General Project and Proposed Alignment 	<ul style="list-style-type: none"> Township of King Councillor Avia Eek (Ward 6) provided support for the project, noting that the project will benefit landowners who experience high volume traffic and agricultural business owners moving products. 	<ul style="list-style-type: none"> Support acknowledged and confirmation that comments will be reviewed and considered.
Other Stakeholders	<ul style="list-style-type: none"> Community Engagement Process and Activities 	<ul style="list-style-type: none"> A few individuals requested to be added to the Project Contact List Several property owners and tenants provided signed Permission to Enter forms Several property owners requested they be notified in advance of any property visits One property owner requested a mailed copy of a Permission to Enter package. Two property owners requested a mailed copy of a Permission to Enter package. 	<ul style="list-style-type: none"> Contacts were added to the Project Contact List and acknowledgement provided Confirmation that the Project Team has received their signed Permission to Enter form Confirmation that the Project Team will notify all individuals listed in connection to a property a minimum of two days in advance Confirmation that a hard copy of the individual's Permission to Enter package was sent via mail, however an electronic copy was attached to the email for convenience.
Other Stakeholders	<ul style="list-style-type: none"> Environmental Concerns – Natural Environment 	<ul style="list-style-type: none"> Several property owners requested clarification on the environmental field work that will be conducted on their properties Several property owners requested assistance in filling out their Water Well Survey Form. 	<ul style="list-style-type: none"> Confirmation that the field work will consist of non-intrusive and physical work related to engineering, geotechnical, and environmental testing, and any disturbance to the property will be restored to the original condition Connected with groundwater specialist to assist in filling out the Water Well Survey Form.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Other Stakeholders	<ul style="list-style-type: none"> ■ Environmental Concerns – Social and Economic Environment 	<ul style="list-style-type: none"> ■ Several individuals provided property details and expressed concern regarding impacts to adjacent properties and the legislative process for land expropriation ■ Several individuals requested meetings with the Project Team regarding impacts to their property ■ One individual requested to know if any areas within and adjacent to the preferred route are currently restricted from redevelopment ■ One property owner informed the Project Team their house is historically designated and requested a seismic survey as vibration equipment would damage the rubble foundation. ■ One individual inquired about an Order-in-Council designation for a property. 	<ul style="list-style-type: none"> ■ Acknowledgment of the information provided for individual properties, and confirmation that the Ministry works directly with impacted property owners to discuss property-specific concerns. The Project Team noted that land expropriation is only used when agreements cannot be reached within suitable project timeframes ■ Facilitation of meetings with impacted property owners ■ Directed to the Project Website to view the alignment and proposed interchanges and details provided on the controlled-access highway designation for lands deemed required for future construction of the project ■ Acknowledgement of the historical designation and confirmation construction activities and equipment have not yet been determined. ■ Explained an Order-in-Council designation will require any development applications proposed for the subject lands to be reviewed by the Ministry of Transportation.
Other Stakeholders	<ul style="list-style-type: none"> ■ Engineering, Transportation and Design 	<ul style="list-style-type: none"> ■ Telus Mobility confirmed they do not have underground infrastructure in the Study Area. ■ Several utility companies confirmed they have underground infrastructure in the Study Area. 	<ul style="list-style-type: none"> ■ Acknowledgement of the information provided for the utilities in the Study Area. ■ Acknowledgement of the information provided for the utilities in the Study Area, and further co-ordination discussions will follow.
Other Stakeholders	<ul style="list-style-type: none"> ■ Interchange Locations and Design 	<ul style="list-style-type: none"> ■ One individual requested detailed mapping of the proposed interchange at County Road 4 / Yonge Street. 	<ul style="list-style-type: none"> ■ Directed to the Project Website to view details on the interchange on County Road 4 / Yonge Street.
Public	<ul style="list-style-type: none"> ■ Community Engagement Process and Activities 	<ul style="list-style-type: none"> ■ Several individuals requested to be added to the Project Contact List ■ Several individuals requested to be removed from the Project Contact List ■ Two individuals expressed privacy concern with the emailing of the Public Information Centre #1 notices ■ One individual requested the link to the Public Information Centre #1 materials on the Project Website ■ Several individuals left voicemails asking for a member of the Project Team to return their call ■ Several individuals requested copies of the environmental studies ■ Several individuals inquired if outreach with Indigenous communities has occurred ■ Several individuals requested clarification on the date and time for Public Information Centre #1. 	<ul style="list-style-type: none"> ■ Contacts were added to the Project Contact list and acknowledgement provided ■ Contacts were removed from the Project Contact List and acknowledgement provided ■ The Project Team apologized for the breach of information, and identified precautions to avoid future errors ■ Provided a link of where the Public Information Centre #1 materials are located on the Project Website ■ Calls returned to address individual concerns and provided further information ■ Confirmation that the results of the environmental studies will be presented in Public Information Centre #2 and will be available for review on the Project Website ■ Confirmation that the Ministry is fulfilling its Duty to Consult requirements for Indigenous communities and will consider their interests throughout the Preliminary Design ■ Confirmation of the date and time of Public Information Centre #1, and the comment period.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Public	<ul style="list-style-type: none"> ■ Environmental Concerns – Natural Environment 	<ul style="list-style-type: none"> ■ Several individuals inquired if the Endangered Species Act is being applied to the project ■ Several individuals expressed concern regarding surface water and runoff from the Bradford Bypass into Lake Simcoe and the Holland River ■ Several concerns regarding impacts to the surrounding environment, specifically flora and fauna, wetlands, trees, wildlife corridors and habitats, and Species at Risk ■ Several individuals expressed navigability concerns of the Holland River East Branch ■ One individual called to inform the Project Team of the coyote den within the Technically Preferred Route ■ Several individuals expressed concern about the project impact on the Holland Marsh, Greenbelt and Lake Simcoe ■ One individual inquired if a Greenhouse Gas Emission analysis will be completed for all phases of the project. 	<ul style="list-style-type: none"> ■ Confirmation the Preliminary Design is adhering to all relevant new and existing provincial and federal legislation, including the Endangered Species Act ■ Provision of details outlining the approach taken to conduct surface water assessment as part of the project, confirmation that Lake Simcoe Region Conservation Authority and Nottawasaga Valley Conservation Authority will be consulted throughout the project, and confirmation that the Ministry will assess impacts with respect to the Lake Simcoe Protection Act ■ Provision of details outlining the approach taken to conduct a terrestrial assessment that includes evaluation of wildlife crossings / exclusion fencing, and confirmation that the Project Team is consulting with regulatory agencies throughout all project phases ■ Confirmation the design and future construction will take into consideration navigability and maintaining proper access to the Holland River and Holland River East Branch ■ Acknowledgment and confirmation the Project Team will provide the information to the wildlife specialists ■ Confirmation that various environmental studies are being undertaken to identify environmental concerns, commitments and mitigation measures and results will be summarized in the Environmental Conditions Report and Environmental Impact Assessment Report ■ Confirmation that the Ministry is undertaking an Air Quality Impact Assessment which will examine potential changes in local and regional air quality, including greenhouse emissions and recommend mitigation measures and future commitments.
Public	<ul style="list-style-type: none"> ■ Environmental Concerns – Social and Economic Environment 	<ul style="list-style-type: none"> ■ Several individuals provided information regarding their watercraft usages ■ Several individuals expressed concern regarding noise and vibration levels and requested mitigation measures be implemented to reduce these impacts ■ Several individuals expressed concern regarding impacts to prime agricultural lands and specialty crop areas, and requested to know where local produce will be grown once the land is paved ■ Several individuals inquired about land expropriation and purchasing of properties ■ One individual recommended vegetation, trees, and green walls to mitigate noise pollution ■ Several individuals inquired about how the time savings were calculated ■ Several residents on Chelsea Crescent requested the exact distance between Chelsea Crescent and the Bradford Bypass ■ One individual inquired about impacts to marina operations along the alignment during construction and operation of the Bradford Bypass 	<ul style="list-style-type: none"> ■ Watercraft and navigational uses acknowledged with a note that design considerations will include the information to meet requirements under the Canadian Navigable Water Act, in consultation with Transport Canada ■ Confirmation that the Ministry is undertaking a noise and vibration assessment as part of the project and will follow the Ministry of Transportation's Noise Guide to evaluate noise barrier types and locations ■ Confirmation that an Agricultural Impact Assessment will be completed, and consultation with local farming communities and the Ontario Ministry of Agriculture, Farming and Rural Affairs is ongoing ■ Confirmation that the Ministry works directly with impacted property owners to discuss property-specific concerns and noted that land expropriation is only used when agreements cannot be reached within suitable project timeframes ■ Confirmation that the Ministry is exploring innovative opportunities to address noise mitigation through engineering and other enhancements

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
		<ul style="list-style-type: none"> ■ Several individuals inquired about archaeological studies being conducted ■ Several individuals requested a link to the Traffic Study ■ One individual expressed concern of disruption to a historic site near Lower Landing. 	<ul style="list-style-type: none"> ■ Confirmation the travel time savings are calculated based on the time of day and origins within the limits of the corridor using an area-wide transportation model with a 2041 horizon year ■ Directed to the Project Website to view details on the County Road 4 / Yonge Street interchange ■ Confirmation that the Ministry is working with Transport Canada to design bridge structures in compliance with the Canadian Navigable Waters Act and asked the individual to provide further information about types of vessels in use at the marina ■ Confirmation that a Stage 1 Archaeological Assessment was completed prior to Preliminary Design, a Stage 2 assessment is currently underway, and Stage 3 and Stage 4 assessments will be completed where required ■ Confirmation that the Ministry is undertaking a traffic study and the information, date, and findings completed will be summarized in the Draft Environmental Conditions Report and draft Environmental Impact Assessment Report ■ Confirmation that the Ministry is undertaking a Cultural Heritage Evaluation Report and the results will be factored into the design refinements and evaluation of alternatives for the preferred Preliminary Design.
<p>Public</p>	<ul style="list-style-type: none"> ■ Engineering, Transportation and Design 	<ul style="list-style-type: none"> ■ One individual recommended to relocate the bypass north of Bradford, close to 12th Line to connect to Ravenshoe Road ■ A few individuals provided suggestions for municipal / regional roads, including number of lanes, speed limits, carpool lots, and pedestrian access ■ Several individuals requested expressed concern with increased traffic congestion ■ One individual inquired about the width of the highway ■ One individual requested the Preliminary AutoCAD Interchange Engineering design drawings for the Highway 400 interchange, preliminary geotechnical, hydrogeological and groundwater monitoring reports surrounding their client's property, and to be notified of upcoming public meetings, notices and project design updates ■ One individual recommended using suspension bridges as part of the project design ■ One individual provided suggestions regarding the types of structures built over wetlands and construction methods in order to reduce impacts to wildlife and wildlife habitats ■ One individual expressed concern that the Bradford Bypass would redistribute extra traffic north of Highway 404, which will require widening to accommodate the new volume. ■ One individual inquired about the design status for an overpass at Professors Day Drive. 	<ul style="list-style-type: none"> ■ Confirmation that the Preliminary Design will not explore alternative routes for the project, but will refine the Technically Preferred Route from the 2002 Approved Environmental Assessment ■ Noted that that Ministry is not responsible for road conditions on existing municipal roads ■ Confirmation hat a traffic study will be completed for the project and summarized in the Environmental Conditions Report and Environmental Impact Assessment Report ■ Noted that the highway design is still being drafted ■ The Project Team noted that design alternatives are still in progress, and will be made available for public review and comment at the upcoming Public Information Centre #1 ■ Noted design alternatives are being developed and will be made for public review and comment at the first Public Information Centre ■ Details provided on the various engineering and environmental studies underway and confirmation that structures will be designed in accordance with latest design standards, guidelines and policies, while considering navigation requirements and environmental constraints ■ Confirmation that suggestions to improve Highway 404 have been shared with the Ministry for consideration. ■ Confirmation the Bradford Bypass will accommodate the future extension of the Professor Day Drive crossing.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Public	<ul style="list-style-type: none"> ■ Project Planning and Timelines 	<ul style="list-style-type: none"> ■ Several individuals inquired about project and construction timelines ■ Several individuals inquired about implications to the project as a result of changes in government. ■ Several individuals inquired about the cost of the construction of the highway. ■ Several individuals inquired about why Ministry of Transportation is advancing the County Road 4 Early Works ahead of the rest of the project ■ One individual inquired about the date the Bradford Bypass was approved to be built. 	<ul style="list-style-type: none"> ■ Details provided on the schedule for Preliminary Design and subsequent design and construction phases ■ Confirmation that, at the time of the correspondence, the Ministry is proceeding with the Preliminary Design study, and that project-related decisions resulting from a change in government are not yet known ■ Confirmation that the cost of construction is yet to be determined, as subsequent design phases are subject to approvals ■ Confirmation that, at the time of this correspondence, the Ministry has not awarded the contract for the construction of the project, and will follow the standard process for issuing requests for proposals through the Registry, Appraisal and Qualification System. ■ Clarification that the Ministry reinitiated design activities for the project in August 2019, and the project is currently in the Preliminary Design phase.
Public	<ul style="list-style-type: none"> ■ Interchange Locations and Design 	<ul style="list-style-type: none"> ■ Several individuals requested an interchanges at 10th Sideroad and Yonge Street ■ One individual requested information on the distance between Queensville Sideroad and the interchange proposed at Bathurst Street ■ One individual inquired about the location of the Leslie Street interchange. ■ One individual indicated they are in favour of the project with exception to the interchange proposed at Bathurst Street. ■ One individual requested the distance between Queensville Sideroad and the centreline of the Bathurst Street interchange. ■ One individual requested the distance between Holborn Road and the centreline of the Bathurst Street interchange. 	<ul style="list-style-type: none"> ■ Support / recommendations acknowledged with a note that the Project Team is evaluating design refinements of the 2002 Approved Environmental Assessment highway alignment ■ Directed to the Project Website to view details of the 2002 Approved Environmental Assessment alignment ■ Directed to the Project Website to view details on the Leslie Street interchange ■ Confirmation the Bathurst Street interchange was identified in the 2002 Approved Environmental Assessment, and a traffic demand assessment confirmed the location of the interchange would help service the provincial needs. ■ Confirmation the centreline of the Bradford Bypass at the proposed Bathurst Street interchange is approximately 1.4 kilometre north of Queensville Sideroad. ■ Confirmation the centreline of the Bradford Bypass at the proposed Bathurst Street interchange is approximately 0.8 kilometre south of Holborn Road.

Stakeholder	Comment Theme	Summary of Comments Received	Project Team Response
Public	<ul style="list-style-type: none"> ■ Environmental Assessment Process 	<ul style="list-style-type: none"> ■ Several individuals inquired about the environmental studies being undertaken as part of the project, expressed concern regarding the environmental assessment process and noted that the environmental assessment is out of date ■ Several individuals requested clarification on the affect of the proposed project exceptions to the environmental assessment process ■ One individual requested a copy of the 2002 Approved Environmental Assessment ■ Several individuals indicated the project should be undergo a Federal Impact Assessment. 	<ul style="list-style-type: none"> ■ Confirmation that 15 environmental studies are being undertaken as part of the project in accordance with the Regulation carrying forward commitments from the 2002 Approved Environmental Assessment. Impact assessments undertaken as part of the project will follow appropriate policies / legislations and several provincial and federal regulatory agencies will be consulted throughout the project ■ Confirmation that, at the time of the correspondence, the proposed exemption was being considered by Ministry of the Environment, Conservation and Parks, but environmental impact assessments and required consultation with Indigenous communities and other stakeholders will be completed regardless of the outcome. ■ Directed to the Project Website to view information on the 1992-1997 Route Planning study and 2002 Approved Environmental Assessment ■ Confirmation the Minister of Environment and Climate Change Canada announced the project did not meet the requirements to warrant designation under the Federal Impact Assessment Act.
Public	<ul style="list-style-type: none"> ■ General Project and Proposed Alignment 	<ul style="list-style-type: none"> ■ Several individuals expressed support for the project ■ Several individuals requested alternative routes to the proposed alignment and expressed opposition to the project ■ One individual inquired about why the Bradford Bypass has not been given a highway 400 series name ■ Several individuals inquired about the Bradford Bypass being a toll road. ■ Several individuals inquired about contractors being selected for the Detail Design and Construction ■ Several individuals noted rapid and public transit would also help ease congestion ■ Two individuals noted that the COVID-19 pandemic has changed the needs in the region and the project is no longer needed. ■ One individual requested clarification on why the Bradford Bypass signs were removed. 	<ul style="list-style-type: none"> ■ Acknowledgment of support provided ■ Recommendations and concerns acknowledged. ■ Acknowledgement of concerns and lack of support for the highway, and noted that the Preliminary Design will not explore alternative routes for the project, but will refine the Technically Preferred Route from the 2002 Approved Environmental Assessment ■ Clarified a route number for the Bradford Bypass has not been given, and will be assigned closer to the highway's construction ■ Confirmation that the Bradford Bypass will not be a toll road ■ Confirmation that, at the time of this correspondence, the Ministry has not awarded the contract for the construction of the project, and will follow the standard process for issuing requests for proposals through the Registry, Appraisal and Qualification System ■ Confirmation that the project is only one investment in transit and transportation infrastructure, and the Ministry is also moving forward with two-way, all-day service every 15 minutes on key segments of the GO Transit rail network ■ Details provided on the rationale for the project, noting that it is required to help address road congestion and improve connectivity in the Greater Golden Horseshoe. ■ Confirmation the Bradford Bypass signs were removed because of vandalism and will be replaced at a later date.

4.8 Draft Environmental Conditions Report Public Consultation and Review Period

The Draft Environmental Conditions Report was available to the public, technical stakeholders, elected officials, Indigenous communities, and other interested persons for review from August 12, 2022 to September 16, 2022. During this time, Indigenous communities and interested persons had the opportunity to submit written comments to the Project Team through the Project Website.

Consultation on the Draft Environmental Conditions Report was carried out in accordance with Section 18 of the Regulation. Upon completion of the consultation, the Ministry updated the Draft Environmental Conditions Report in accordance with Section 19 of the Regulation. This Final Environmental Conditions Report has been published to the Project Website on October 27, 2022 in accordance with Section 19 (2) of the Regulation.

5. Proposed Changes to the Technically Preferred Route

In accordance with Section 16(2)(4)(ii and iii), Section 16(2)(5) and Section 16(2)(6) of the Regulation, this section summarizes the proposed changes to the Technically Preferred Route of the 2002 Approved Environmental Assessment. These changes focus on those design refinement alternatives that have been proposed as a result of changes to the environmental conditions and provides a description of the alternatives for the changes to the Technically Preferred Route.

5.1 Potential Refinements

Since the 2002 Approved Environmental Assessment for the project, environmental conditions within the Study Area have changed, environmental policies and legislative requirements have been amended, and highway design standards have been updated. As part of this project-specific assessment of environmental impacts study, the Project Team examined areas where design refinements to the Technically Preferred Route may be required, and where changes, amendments or updates are needed. **Table 5-2** outlines 18 proposed refinements to the Technically Preferred Route and identifies if the refinements were triggered by environmental conditions changes or design requirements (e.g., changes to design or safety standards). Several of these refinements have been presented for public comment as part of Public Information Centre #1 (2021) and the Preliminary Design Interchange Considerations Consultation Event (2022). Under the Regulation, Section 16(2), only those two design changes that are triggered by a change in environmental condition and highlighted in **Table 5-2** are described further in this Draft Environmental Conditions Report. The Preliminary Design refinements, alternatives, and the evaluation, will be presented at Public Information Centre #2 in the fall of 2022. This process will also form the preferred Preliminary Design and will be documented in the Environmental Impact Assessment Report as the Updated Technically Preferred Route.

In accordance with Section 16(3)(b)(i) of the Regulation, the Proponent (the Ministry) must evaluate any proposed changes that fall outside the Study Area as defined in the Regulation and complete studies in accordance with the Class Environmental Assessment. The Ministry is currently undertaking an evaluation of the changes and will be documenting the results in the Environmental Impact Assessment Report, under separate cover. At the time of this Environmental Conditions Report, one design refinement alternative to the Technically Preferred Route is anticipated to extend beyond the Study Area. This change is associated with the tie-in of the proposed freeway-to-freeway ramp from the project to southbound Highway 404 and is being considered as a Group C project under the Class Environmental Assessment process. The change is being driven by current design standards for the freeway-to-freeway ramps to meet the

requirement for freeflow movement between the Bradford Bypass and Highway 404 and to maintain connectivity to the Queensville Sideroad interchange with an existing carpool lot. If additional design changes for the freeway-to-freeway interchanges go beyond the Study Area, these works will be assessed under a separate Class Environmental Assessment and documented in the Environmental Impact Assessment Report.

For each of the alternatives, the Project Team will use a reasoned argument (trade-off) method of evaluation to identify the advantages and disadvantages to select the design refinements and alternatives. The evaluation factors and criteria outlined in Public Information Centre #1 will be used to evaluate the refinements and alternatives and are summarized in **Table 5-1**.

Table 5-1: Summary of Refinement Evaluation Factors and Criteria

Evaluation Factor	Criteria
Transportation and Engineering	<ul style="list-style-type: none"> ■ Traffic Operations and Safety ■ Highway Geometrics and Design Standards ■ Structural Engineering ■ Foundation and Geotechnical Conditions ■ Active Transportation ■ Utilities and Stormwater Management ■ Constructability and Staging ■ Navigability ■ Cost
Natural Environment	<ul style="list-style-type: none"> ■ Fish and Fish Habitat ■ Terrestrial Ecosystems ■ Wildlife Crossings ■ Species at Risk ■ Environmentally Significant Features ■ Groundwater ■ Surface Water (Drainage & Hydrology) ■ Drinking Water ■ Fluvial Geomorphology ■ Greenways and Open Space Linkages
Socio-Economic Environment	<ul style="list-style-type: none"> ■ Aesthetics and Landscaping ■ Noise, Vibration and Air Quality ■ Contamination and Property Waste ■ Residential Property ■ Agricultural Lands ■ Land Use (Policy Areas, Designated Areas) ■ Approved Plans and Policies ■ Snowdrift ■ Human Health
Cultural Environment	<ul style="list-style-type: none"> ■ Archaeological Resources ■ Built Heritage and Cultural Landscapes ■ Indigenous Communities and Treaty Rights

The change in environmental conditions that triggered the consideration of a design refinement will be considered for risk and sensitivity within the context of that criteria. Each criteria sensitivity is given a factor-specific ranking of importance within the reasoned argument evaluation method in order to understand the relative importance of a potential impact across all factors and criteria.

5.2 Refinements to the Technically Preferred Route as a Result of Changes to Environmental Conditions

The following sections outline refinements to the Technically Preferred Route that were identified in **Table 5-2** that were triggered based on changes to environmental conditions since the 2002 Approved Environmental Assessment for the project. A full assessment of environmental impacts will be undertaken for the Updated Technically Preferred Route for all proposed design refinements.

5.2.1 Bradford Bypass between 10th Sideroad and County Road 4

5.2.1.1 Reason for Refinement

As noted in **Section 2.3.1**, a Stage 2 Archaeological Assessment was carried out and resulted in the discovery of archaeological resources. Following the completion of Stage 2 work, a Stage 3 Archaeological Assessment has been advanced to determine the limits and protective buffers of a particular archaeological site. The newly identified archaeological site, is identified as the Bradford Hill site (BaGv-112). The Technically Preferred Route alignment will cross through area and result in a direct impact this site. As a result, the Project Team has considered design alternatives to propose avoidance options. These alignment options to the Technically Preferred Route between 10th Sideroad and County Road 4, are presented in **Figure 5-1** and discussed below.

5.2.1.2 Alternatives Considered

The following alternatives are being considered to address the anticipated potential impacts associated with the Technically Preferred Route between 10th Sideroad and County Road 4:

- Base Case: no change to the Technically Preferred Route (**Figure 5-1**)
 - This alternative maintains the Technically Preferred Route.
- Refinement Alternative 1: 1,700 metre radii (**Figure 5-2**, red route)
 - This alternative realigns the Bradford Bypass between 10th Sideroad and County Road 4 to the north to avoid potential impacts to the Bradford Hill archaeological site (BaGv-112). This alternative impacts the County Road 4 Early Works design.

- Refinement Alternative 2: 1,700 and 1,300 metre radii (**Figure 5-2**, green route)
 - This alternative further realigns the Bradford Bypass between 10th Sideroad and County Road 4 to the north to avoid potential impacts to the Bradford Hill archaeological site (BaGv-112) and highway curves in the area. This alternative mitigates impacts to the County Road 4 Early Works design.
- Refinement Alternative 3: 1,300 metre radii (**Figure 5-2**, blue route)
 - This alternative is similar to Alternative 2; however, it features a constant 1,300 metre radius placing the alignment between Alternative 1 and 2. This alternative avoids potential impacts to the Bradford Hill Archaeological site (BaGv-112) and mitigates impacts to the County Road 4 Early Works design.

A Preliminary Design alternative that proposed a minor northly shift of the mainline by 10 metres was presented at Public Information Centre #1. This alternative was not carried forward as a viable alternative, as there is a negligible change in potential impacts compared to the Base Case when considering the archaeological site.

5.2.1.3 Preliminary Evaluation of Refinement Alternatives

Table 5-3 presents an overview of design and environmental constraints to support the preliminary evaluation of the proposed alternatives compared to the Base Case scenario identified as part of the Technically Preferred Route. Of the new alternatives being presented, a preferred alternative will be selected (referred to as the Updated Technically Preferred Alternative). As the study process is currently ongoing for the Preliminary Design, along with consultation and engagements efforts, the opportunity exists for identification of additional refinements to the alternatives presented and update to the evaluation. Should additional alternatives or refinements be identified after completion of this Draft Environmental Conditions Report, the alternatives or refinements will be presented at Public Information Centre #2 and fully documented in the Environmental Impact Assessment Report.

Table 5-2: Summary of Potential Refinements to the Technically Preferred Route

ID	Location	Refinement	Refinement Trigger	Trigger Category
1	■ Highway 400 Interchange	■ New directional ramps	■ Updated to reflect new highway design standards.	■ Design
2	■ Highway 400 and 9 th Line	■ New Structure	■ Design changes to accommodate the Bradford Bypass ramps and Highway 400 widening (by Stantec).	■ Design
3	■ McKinstry Road	■ Reconstruction	■ Design change to accommodate Highway 400 widening ramps, accommodate Highway 400 widening and County Road 88 Interchange improvements (by Stantec).	■ Design
4	■ County Road 88	■ No refinement	■ Not applicable as the work is advancing under a separate Ministry project.	■ Not applicable
5	■ 10 th Sideroad	■ Introduction of an interchange	■ A municipal request was made by the Town of Bradford West Gwillimbury and Simcoe County to include an interchange at this location.	■ Design
6	■ Highway Alignment Refinement Alternative at Future Professor Day Drive Between 10 th Sideroad and County Road 4	■ Minor alignment shift	■ Highway vertical profile design change. ■ Avoids property impacts.	■ Design
7	■ Between 10 th Sideroad and County Road 4	■ Realignment to the north	■ An alignment change was recommended to avoid potential impacts to the Bradford Hill archaeological site (BaGv-112) identified during the Stage 2 Archaeological Assessment (in 2021).	■ Environmental
8	■ County Road 4	■ No interchange refinements	■ Not applicable. Refer to County Road 4 Early Works.	■ Not applicable
9	■ Between County Road 4 and Holland River at Artesian Industrial Parkway	■ Radius correction	■ Update the highway design to reflect new design standards and safety requirements.	■ Design
10	■ Bathurst Street Interchange	■ Interchange configuration options for the adjacent access road	■ Corridor Management criteria: Marina entrance options relative to the interchange intersections are to be considered.	■ Design
11	■ Holland River East Branch	■ Realignment of highway to the south	■ Avoids impacts to Albert's Marina and Silver Lakes Golf Course in consideration of the 2002 Approved Environmental Assessment condition, and mitigates impacts to fish habitat for pier placement along the meander bends and a backwater refuge area; and, avoids the Holland River East archaeological site (BaGv-42).	■ Commitment under the 2002 Approved Environmental Assessment ■ Design and Environmental
12	■ 2 nd Concession Road	■ Introduction of an interchange	■ A municipal request was made the Town of East Gwillimbury and York Region to include an interchange at this location.	■ Design
13	■ Hydro Tower Relocations at Leslie Street Interchange	■ Realignment to avoid hydro towers	■ Realignment and Design options to avoid impacts to the existing hydro towers and transmission lines.	■ Design
14	■ Leslie Street Interchange	■ Interchange design option	■ Ramp options between Leslie Street and the westbound ramp, and considerations for weaving and merging traffic on the westbound Bradford Bypass.	■ Design
15	■ Highway 404 Interchange	■ New directional ramps	■ Update to reflect new highway design standards.	■ Design
16	■ North of Highway 404 Interchange	■ Ramp adjustment	■ Minimize impacts to the existing hydro corridor.	■ Design
17	■ Queensville Sideroad and Highway 404 to the South	■ Modifications to the structure and marginal widening of Highway 404	■ To accommodate the directional ramp from the Bradford Bypass.	■ Design
18	■ Crossing Road Structures	■ Modifications to crossing road sections for overpasses and underpasses	■ Refinements to the highway mainline profile for optimization along the proposed corridor. Which considers municipal Transportation Master Plans and consultation with municipalities.	■ Design

Figure 5-1: 10th Sideroad to County Road 4 – Base Case Technically Preferred Route

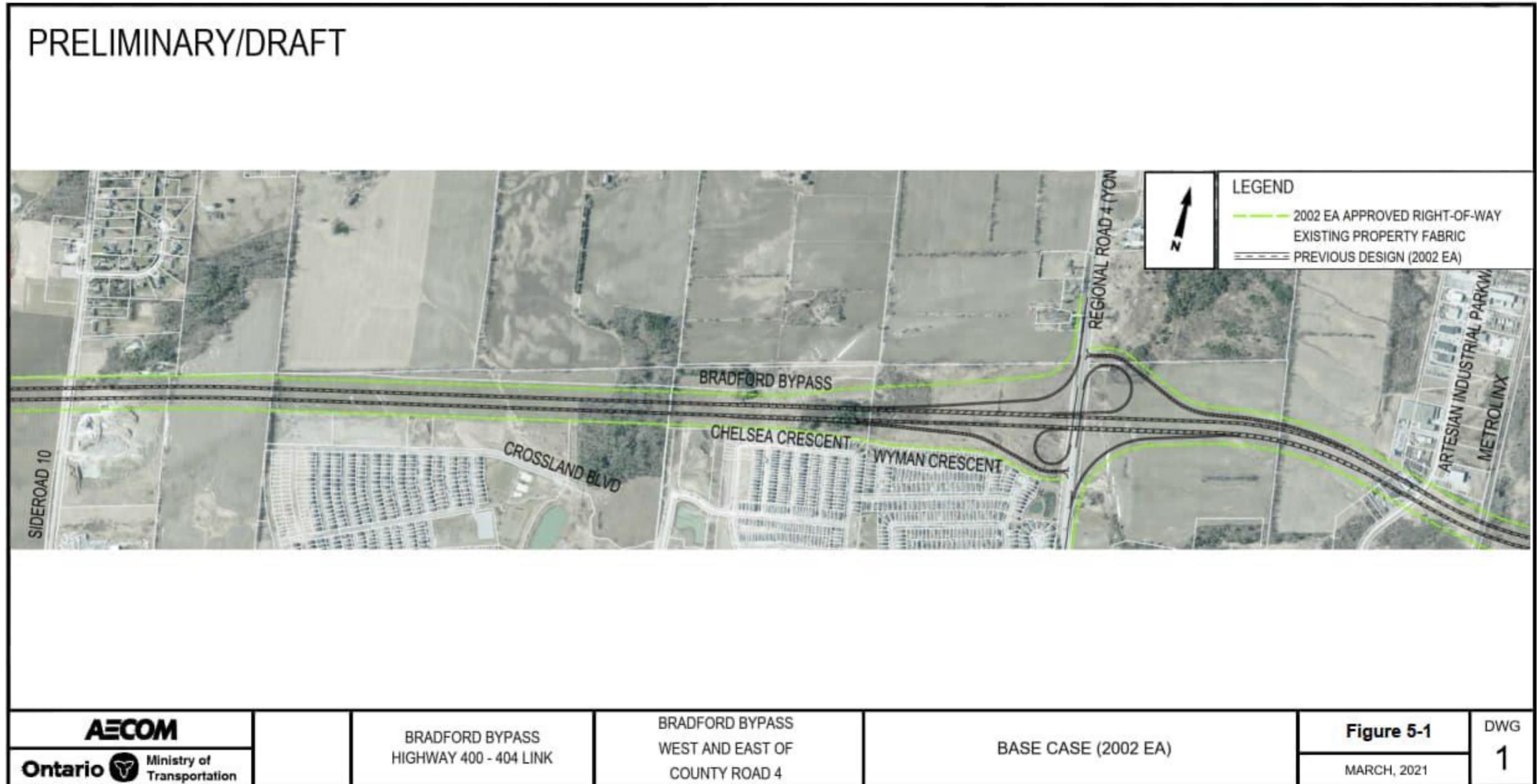


Figure 5-2: 10th Sideroad to County Road 4 - Refinement Alternatives 1, 2 and 3 For Mainline Realignment

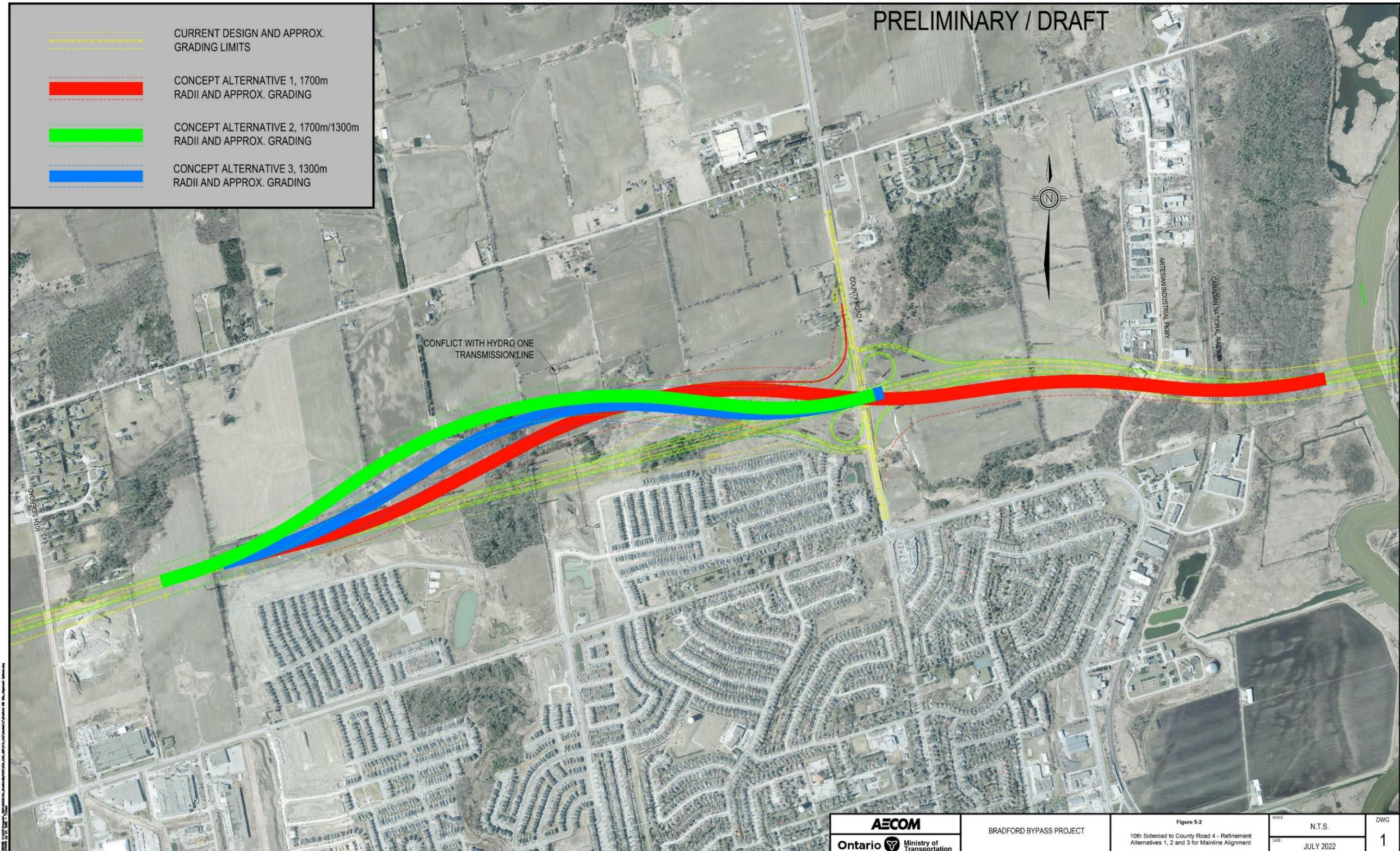


Table 5-3: Summary of Preliminary Evaluation of Mainline Alignment Alternatives

Evaluation Factors and Category	Base Case	Alternative 1 (1,700 metre radii)	Alternative 2 (1,700 and 1,300 metre radii)	Alternative 3 (1,300 metre radii)
Transportation	<ul style="list-style-type: none"> ■ Contained within the Technically Preferred Route right-of-way. ■ No additional property impacts. ■ Greenfield construction. Construction of the project through this corridor can be completed offline. ■ No significant constructability issues anticipated, however, impacts to property owners would create constraints. ■ Cost considerations as a result of impacts to residentially zoned lands. ■ No additional land parcels impacted beyond the Technically Preferred Route right-of-way. 	<ul style="list-style-type: none"> ■ No discernable difference between alternatives with respect to geometric standards. ■ Features multiple curves with 1,700 metres radii through the alignment. ■ Alignment extends beyond the Technically Preferred Route right-of-way to the north but is the closest to the existing alignment of the three alternatives. ■ Greater property impacts compared to the Base Case, west and east of County Road 4. ■ Greenfield construction, construction of the project through this corridor can be completed offline. ■ Higher cost associated with constructing this alternative compared to Base Case. ■ Change in property impacts at Artesian Industrial Parkway, reduced footprint to the north with increased impacts to the south. ■ Skews the Parclo A4 interchange design at County Road 4. 	<ul style="list-style-type: none"> ■ No discernable difference between alternatives with respect to geometric standards. ■ Alignment is comprised of varying radii curvature, including 1,700 metres and 1,300 metres radii curves. ■ Alignment extends beyond the Technically Preferred Route right-of-way west of County Road 4. ■ Greater property impacts compared to the Base Case, west of County Road 4. ■ Greenfield construction. construction of the bypass through this corridor can be completed offline. ■ Higher cost associated with constructing this alternative compared to the Base Case. ■ Skews the Parclo A4 interchange design at County Road 4. 	<ul style="list-style-type: none"> ■ No discernable difference between alternatives with respect to geometric standards. ■ Features multiple curves with 1,300 metres radii through the alignment. ■ Alignment extends beyond the Technically Preferred Route right-of-way west of County Road 4 to the north and falls between Alternatives 1 and 2. ■ Greater property impacts compared to the Base Case, west of County Road 4. ■ Greenfield construction. construction of the bypass through this corridor can be completed offline. ■ Higher cost associated with constructing this alternative compared to the Base Case. ■ Skews the Parclo A4 interchange design at County Road 4.
Traffic	<ul style="list-style-type: none"> ■ No weaving or safety concerns. 	<ul style="list-style-type: none"> ■ No anticipated weaving or safety concerns. 	<ul style="list-style-type: none"> ■ No anticipated weaving or safety concerns. 	<ul style="list-style-type: none"> ■ No anticipated weaving or safety concerns.
Structural	<ul style="list-style-type: none"> ■ Alignment options do not require alteration of the design to the County Road 4 Early Works underpass structure. ■ No retaining walls required. 	<ul style="list-style-type: none"> ■ Alignment option requires alteration to the design of the County Road 4 Early Works underpass structure; however, the structure remains in the same location. ■ Consideration for structural retaining walls may be required to facilitate construction. ■ Adjustments to the Holland River Crossing may be required. 	<ul style="list-style-type: none"> ■ Mitigates impacts to the County Road 4 Structure. ■ No change to the Holland River Crossing. ■ Consideration for structural retaining walls may be required to facilitate. 	<ul style="list-style-type: none"> ■ Mitigates impacts to the County Road 4 Structure. ■ No change to the Holland River Crossing. ■ Consideration for structural retaining walls may be required to facilitate the design.

Evaluation Factors and Category	Base Case	Alternative 1 (1,700 metre radii)	Alternative 2 (1,700 and 1,300 metre radii)	Alternative 3 (1,300 metre radii)
<p>Natural Environment</p> <p>Socio-Economic Environment</p> <p>Cultural Environment</p> <p>Indigenous Communities and Treaty Rights</p>	<ul style="list-style-type: none"> ■ Known archaeological resource with Indigenous community interests. ■ Alignment crosses through an Indigenous archaeological site. ■ Avoids properties with Built Heritage and Cultural Heritage Landscapes. ■ Encroachment into residential developments along the southern right-of-way limit west of County Road 4. ■ Direct property impacts for grading limits west of County Road 4. ■ Prime Agricultural lands likely avoided to the north, primarily within Settlement lands. ■ Crosses through common field crop, cover crop, with most areas open field or non-active agriculture uses. ■ Alignment passes through natural areas (forest, sensitive habitat for species at risk and species at risk habitat west of County Road 4, crosses an unevaluated wetland ■ Crosses one direct and one indirect fish habitat watercourse ■ Alignment through high value aquifer area ■ Encroaches on Special Policy Areas 6 & 7 (Bradford West Gwillimbury) ■ Avoids existing wells, with one well within the interchange ramp at County Road 4 near 8th Line ■ Two warmwater watercourse crossings (Intermittent-direct & Permanent-direct); and two ephemeral non-fish habitat features; channel realignment required at the railway ■ No areas of natural and scientific interest or deer wintering areas 	<ul style="list-style-type: none"> ■ Avoids the Indigenous archaeological site west of County Road 4 compared to the Base Case and Alternative 2, while its closer than Alternative 3 to the site with an increase in impacted area where archaeological resources were found at the County Road 4 Early Works (east of County Road 4); Potential impacts to isolated or undiscovered archaeological resources. ■ Greater impact to existing wells outside the right-of-way for the Base Case and both Alternative 2 and Alternative 3. ■ Modified encroachment through low significant groundwater recharge area at Artesian Industrial Parkway and the rail line. ■ Change in footprint through High Value Aquifer areas with potentially larger footprint compared to the Base Case and Alternative 2. ■ Similar crossing of the intermittent-direct fish habitat; shifts the crossing of one ephemeral feature, affecting an additional upstream tributary branch. May require additional channel realignments at the rail line watercourse (permanent-direct) ■ Alignment is similar to the Base Case, with a shifted location. Greater impacts to vegetation communities compared to Alternative 2 with potential improvement over the Base Case west of County Road 4. ■ Greater impacts to vegetation communities at Artesian Industrial Parkway to the rail line compared to Alternative 2 and the Base Case.; Potentially similar or slightly improved impacts to species at risks for bats and birds (habitat) compared to the Base Case 	<ul style="list-style-type: none"> ■ Anticipated to avoid the Indigenous archaeological site depending upon grading limits compared to the Base Case. Potential impacts to isolated or undiscovered archaeological resources. ■ Larger impact to existing wells outside the right-of-way compared to the Base Case. Avoids impacts compared to Alternative 1, negligible difference compared to Alternative 3. ■ Greater encroachment into medium significant groundwater recharge area at 10th Sideroad compared to the Base Case, and compared to Alternative 1. ■ Change in footprint through High Value Aquifer areas with potentially smaller footprint compared to the Base Case, with change in footprint compared to Alternative 1. ■ Shifts watercourse crossing in intermittent-direct fish habitat to upstream section of intermittent-indirect; and potentially avoids one ephemeral feature. ■ Alignment avoids bisecting a forested area, retaining a larger consolidated forested area; Best avoidance of vegetation impacts compared to Base Case, Alternative 1 and Alternative 3. Best avoidance of species at risk habitat for bats and bird (habitat). ■ Avoids an unevaluated wetland. ■ New and more impacts to hedgerows compared to Base Case. ■ Largest encroachment into Agricultural lands (Bradford West Gwillimbury) compared to Base Case, Alternative 1 and Alternative 3 as the alternative extends east of County Road 4. ■ Encroaches into agricultural lands supporting small grains, common field crop, with potentially greater impacts through cover crop compared to Base Case. 	<ul style="list-style-type: none"> ■ Anticipated to avoid the Indigenous archaeological site depending upon grading limits. Provides greater separation from the site compared to Alternative 1, while being closer than Alternative 2. No change east of County Road 4. ■ Negligible difference in potential impacts to existing wells compared to the Base Case. Better avoidance than the Alternative 1, negligible difference compared to Alternative 2. ■ Similar encroachment within medium significant groundwater recharge area at 10th Sideroad compared to the Base Case. ■ Similar footprint within High Value Aquifer areas compared to the Base Case, with negligible difference compared to Alternative 2 near County Road 4. ■ Similar but shifted crossing of intermittent-direct fish habitat compared to Alternative 1; Similar but shifted crossing of an ephemeral feature compared to Alternative 1. ■ Alignment has a shifted bisection of the forested area west of County Road 4 between that of Alternative 1 and 2, with footprint similar to Alternative 1. ■ Avoids an unevaluated wetland with further separation compared to Alternative 1. ■ Similar impacts to hedgerows compared to Alternative 2. ■ Slightly less encroachment into Agricultural lands (Bradford West Gwillimbury) compared to Alternative 2. The shifted alignment through Settlement lands is slightly greater than Alternative 2, but less than Alternative 1.

Evaluation Factors and Category	Base Case	Alternative 1 (1,700 metre radii)	Alternative 2 (1,700 and 1,300 metre radii)	Alternative 3 (1,300 metre radii)
		<ul style="list-style-type: none"> ■ Minor encroachment into an unevaluated wetland, better than the Base Case, however, slightly greater impact than Alternative 2 and slightly larger impact to wetlands near the railway line compared to the Base Case. ■ Greater encroachment into Agricultural lands (Bradford West Gwillimbury) compared to the Base Case, smaller impact along the edge of the Agricultural Lands Area compared to Alternative 2; shifted alignment through settlement lands is greater than Alternative 2 ■ Encroaches into agricultural lands supporting common field crop. Some agricultural crop types may be avoided or have similar or shifted impacts to the Base Case compared to Alternative 2 and Alternative 3. ■ Avoids Special Policy Area 11 (Bradford West Gwillimbury); larger impact into Special Policy Area 8 compared to the Base Case, similar to other alternatives ■ Impacts one listed Potential Cultural Heritage landscape property; and alters the impact to one potential cultural heritage landscape property compared to the Base Case. ■ Change in encroachment through lands with moderate and high risk for contamination compared to the Base Case and Alternative 2. ■ Change in encroachment through lands with moderate and high risk for contamination compared to the Base Case and Alternative 2. ■ Greater separation from existing residential developments with potential for improved noise attenuation compared to the Base Case. 	<ul style="list-style-type: none"> ■ Avoids Special Policy Area 11 (Bradford West Gwillimbury); Larger impact into Special Policy Area 8. ■ Impacts two listed Potential Cultural Heritage landscape properties. ■ No encroachment onto lands with higher risk of contamination. Similar risk associated with low risk properties compared to Alternative 3. ■ Greater separation from existing residential developments with potential for improved noise attenuation compared to the Base Case. There is negligible difference at County Road 4 compared to the Base Case. ■ Reduces the available lands for development within Settlement lands, between future Professor Day Drive and County Road 4 compared to the Base Case, as lands south of the alignment (in the area of the existing right-of-way) will have limited development potential due to archaeological constraints. Where a connection to Professor Day Drive or Crossland Boulevard is possible, development or land use planning opportunities may still exist, which may be beneficial compared to Alternative 1 or Alternative 3. ■ No change in impact to lands east of County Road 4 compared to the Base Case as the alternative alignment is unchanged east of County Road 4. 	<ul style="list-style-type: none"> ■ Encroaches into agricultural lands supporting small grains, common field crop, with potentially fewer impacts through cover crop compared to Alternative 2. ■ Avoids Special Policy Area 11 (Bradford West Gwillimbury); Negligible difference in the encroachment through Special Policy Area 8 compared to Alternative 2. ■ Potentially avoids one listed Cultural Heritage Landscape property compared to Alternative 2; minor reduced encroachment through the other listed Cultural Heritage Landscape property compared to Alternative 2, and negligible difference from Alternative 2 for encroachment through the potential Cultural Heritage landscape property. ■ No encroachment onto lands with higher risk of contamination. Similar risk through low contamination properties compared to Alternative 2 ■ Lesser separation from existing residential developments compared to Alternative 2. There is negligible difference from the Base Case as the alignment approaches County Road 4. ■ Reduces the available lands for development within Settlement lands, between future Professor Day Drive and County Road 4 compared to the Base Case; however, there is a slight improvement compared to Alternative 2, and shifted in location compared to Alternative 1, as lands south of the alignment (in the area of the existing right-of-way) will have limited development potential due to archaeological constraints. Where a connection to Professor Day Drive or

Evaluation Factors and Category	Base Case	Alternative 1 (1,700 metre radii)	Alternative 2 (1,700 and 1,300 metre radii)	Alternative 3 (1,300 metre radii)
		<ul style="list-style-type: none"> Reduces the available lands for development within Settlement lands, between future Professor Day Drive and County Road 4 compared to the Base Case, with a greater reduction compared to Alternative 2 and Alternative 3, as lands south of the alignment (in the area of the existing right-of-way) will have limited development potential due to archaeological constraints. Where a connection to Professor Day Drive is possible, limited development or land use planning opportunities may still exist. 		<p>Crossland Boulevard is possible, development or land use planning opportunities may still exist, which may be beneficial compared to Alternative 1 and similar to Alternative 2.</p> <ul style="list-style-type: none"> No change in impact to lands east of County Road 4 compared to the Base Case as the alternative alignment is unchanged east of County Road 4.

Preliminary Summary of the Bradford Hill Avoidance Alternatives:

The Base Case is no longer preferred due to the known archaeological resources. While the alternatives generated to date minimize impacts to the newly identified archaeological site, additional refinements to the alternatives presented, along with detailed updates to the evaluation are being considered. The results of the evaluation and selection of the preferred design for the Updated Technically Preferred Route will be presented at Public Information Centre #2 and documented in the Environmental Impact Assessment Report, under separate cover. The preference between each alternative is not known at this stage as they will be carried forward for further evaluation during this Preliminary Design study. Public Information Centre #2 and the future Environmental Impact Assessment Report (under separate cover) will present and document the evaluation and selection of the preferred design for the Updated Technically Preferred Route. Information will include a description of proposed mitigation measures for potential impacts beyond those identified in Section 2 of this Environmental Conditions Report resulting from potential changes to the environmental conditions. It is recognized that incorporation of Alternative 1 would have impacts on the County Road 4 Early Works structural design. The evaluation of the alternatives will consider impacts to the County Road 4 Early Works project as a constraint that requires avoidance or mitigation.

5.2.2 Holland River East Branch

5.2.2.1 Reason for Refinement

The Technically Preferred Route at the Holland River East Branch is shown in **Figure 5-3**. The Technically Preferred Route identified an alignment at the Holland River East Branch that has the potential to impact fish habitat as a result of pier placement along the meander bends and a backwater refuge area and a known archaeological site, the River Bend (BaGv-114). Additionally, socio-economic impacts to the Albert's Marina and Silver Lakes Golf and Country Club were identified.

Design refinements for the highway alignment and river crossing for the Holland River East Branch involve consideration for the commitments and recommendations from the 2002 Approved Environmental Assessment in **Figure 5-3**. This applied environmental conditions related to scour and erosion, and environmental impacts related in-water impacts to fisheries, which include considerations for navigation, economic and community considerations, and cultural environment impacts for archaeological resources to minimize impacts to both Albert's Marina and Silver Lakes Golf Club.

5.2.2.2 Alternatives Considered

The following alternatives are being considered to address the potential impacts associated with the Technically Preferred Route at the Holland River East Branch:

- Base Case – No change to the Technically Preferred Route (**Figure 5-3**):
 - This alternative maintains the Technically Preferred Route
 - This alternative proposes twin structures for eastbound and westbound lanes.
- Refinement Alternative 1 – Curved Transition East of River Crossing: (**Figure 5-4**)
 - The Bradford Bypass to the east of Yonge Street is realigned by approximately 150 metres to the south, the realignment transitions back to the existing alignment just east of Yonge Street.
 - This alternative proposes twin structures for eastbound and westbound lanes.
- Refinement Alternative 2 – Tangent Transition East of River Crossing: (**Figure 5-5**)
 - The Bradford Bypass between Bathurst Street to east of Yonge Street is realigned by approximately 150 metres to the south, the realignment ties into the existing alignment 1 kilometre east of Yonge Street resulting in fewer curves.
 - This alternative proposes twin structures for eastbound and westbound lanes

Figure 5-3: Holland River East Branch - Technically Preferred Route

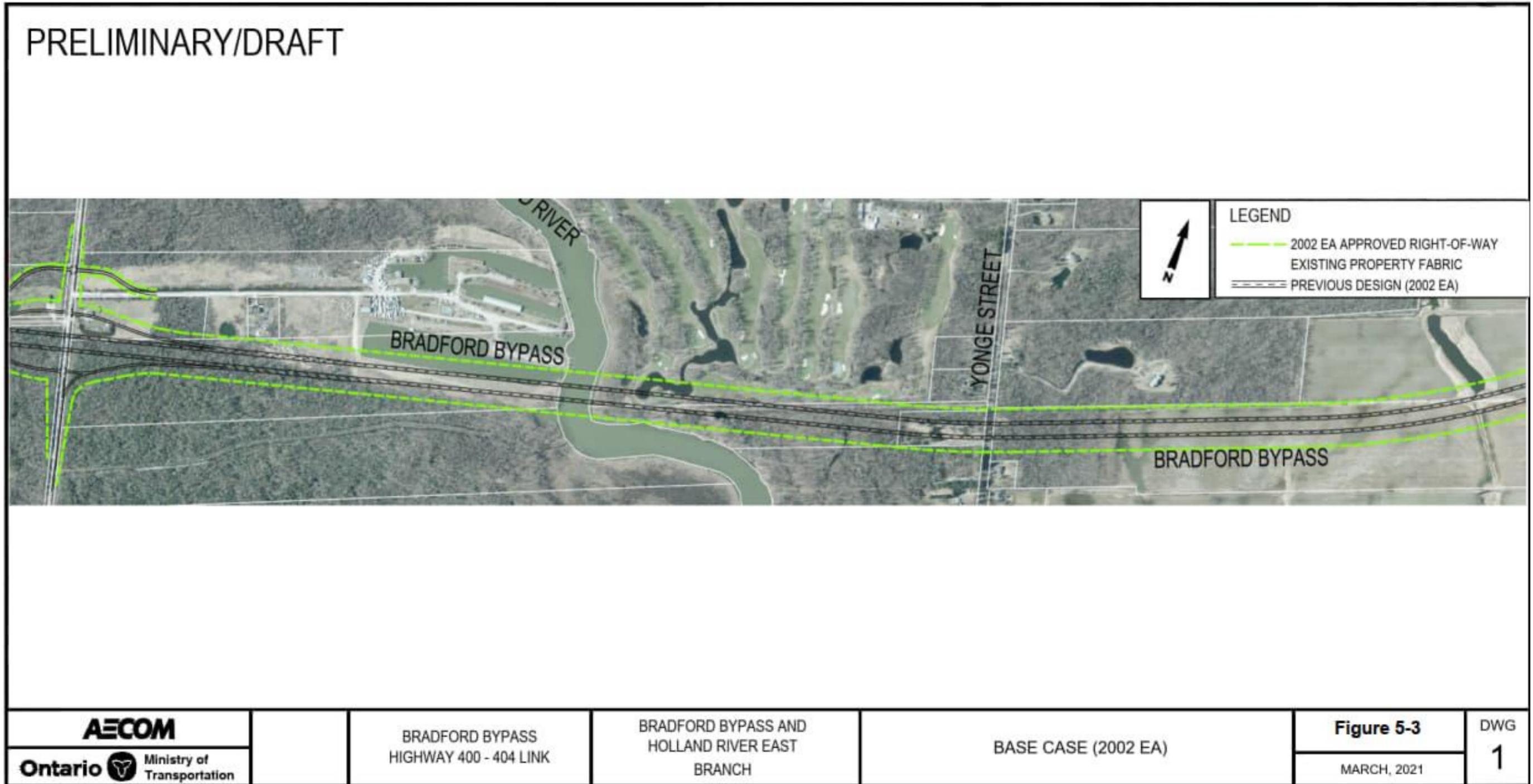


Figure 5-4: Holland River East Branch - Refinement Alternative 1 Curved Transition East of River Crossing

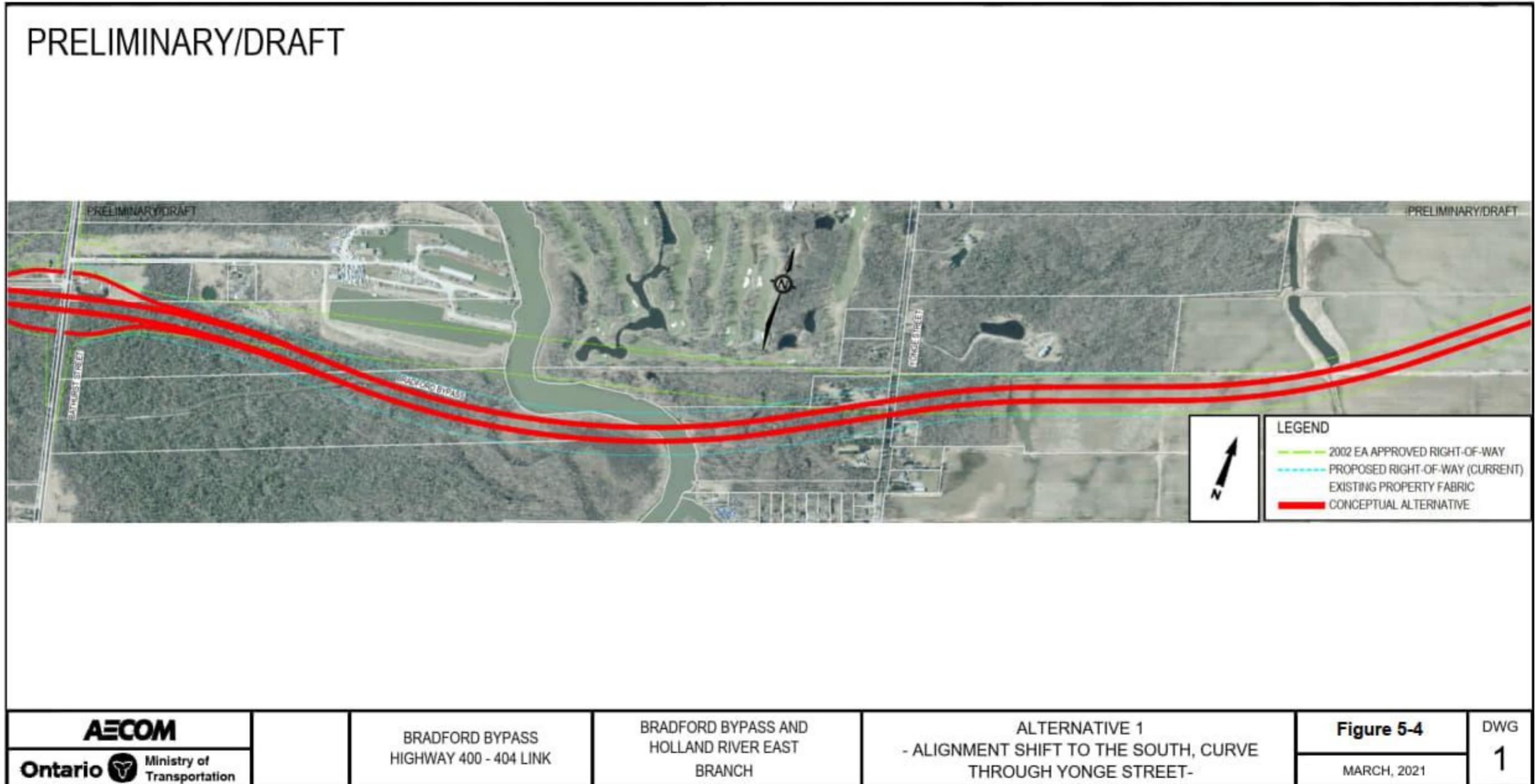
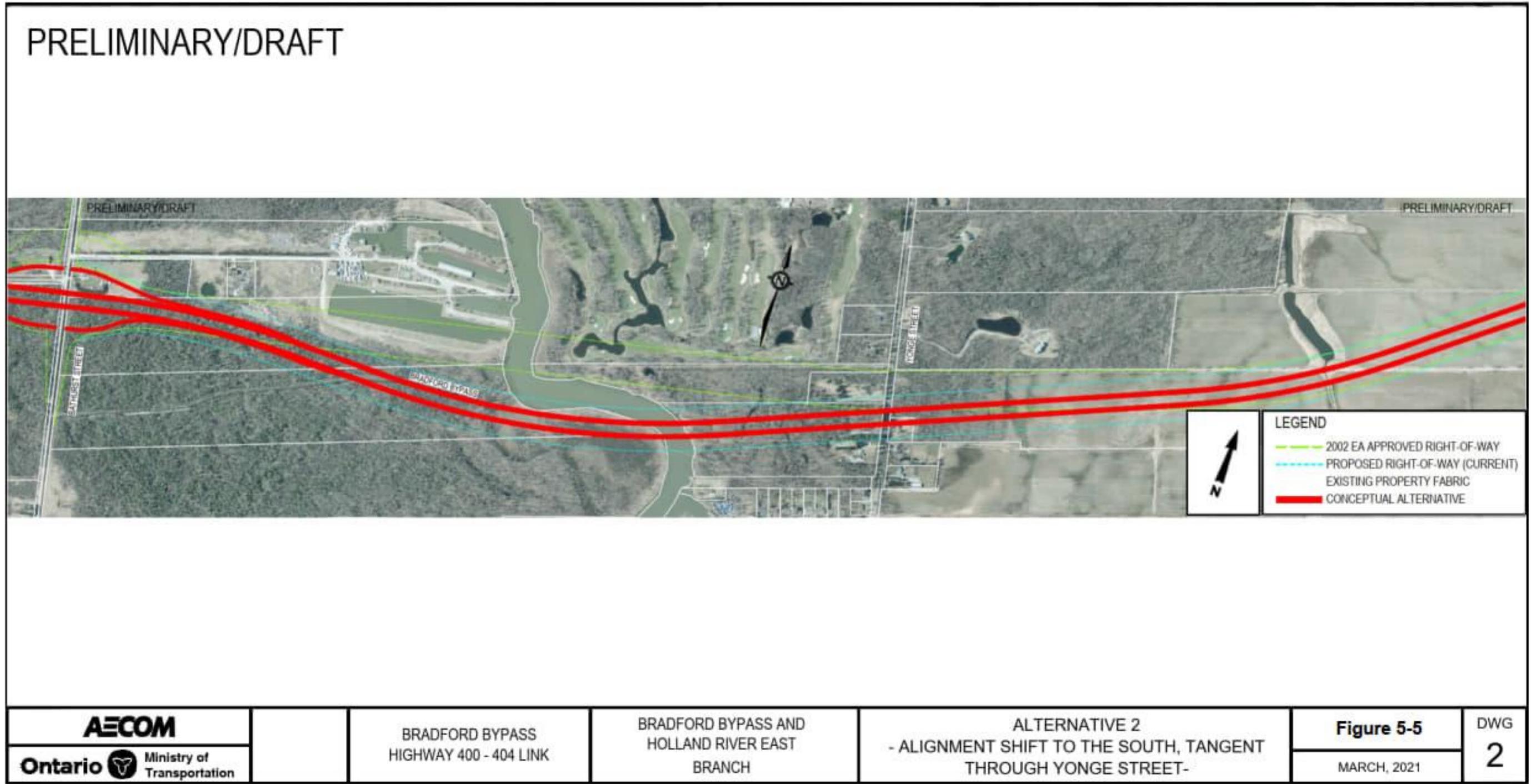


Figure 5-5: Holland River East Branch - Refinement Alternative 2 Tangent Transition East of River Crossing



5.2.2.3 Preliminary Evaluation of Refinement Alternatives

Table 5-4 presents an overview of the preliminary evaluation of the proposed alternatives compared to the Base Case scenario identified as part of the Technically Preferred Route. Of the new alternatives being presented, a preferred alternative will be selected (referred to as the Updated Technically Preferred Alternative). As the study process is currently ongoing for the Preliminary Design along with consultation and engagements efforts, the opportunity exists for identification of additional refinements to the alternatives presented. Should additional alternatives or refinements be identified after completion of this Draft Environmental Conditions Report the alternatives and refinements will be documented at the future Public Information Centre #2 and in the Environmental Impact Assessment Report. Additionally, the Updated Technically Preferred Alternative will be presented at Public Information Centre #2 and fully documented in the Environmental Impact Assessment Report.

Table 5-4: Summary of Preliminary Evaluation of Holland River East Branch Alternatives

Evaluation Factors and Category	Base Case	Alternative 1 – Curved Transition	Alternative 2 – Tangent Transition
Transportation	<ul style="list-style-type: none"> ■ No discernable difference with respect to geometric standards between alternatives. ■ No property required beyond the Technically Preferred Route right-of-way. ■ Greatest commercial and archaeological impacts. ■ Least land parcels impacted. ■ Constructability considered to be low complexity and no discernable difference between alternatives, various design constraints. 	<ul style="list-style-type: none"> ■ No discernable difference with respect to geometric standards between alternatives. ■ Additional property required beyond the Technically Preferred Route right-of-way. ■ Least impacts to the Marina and Silver Lakes Golf Course. ■ Constructability considered to be low complexity and no discernable difference between alternatives, various design constraints. 	<ul style="list-style-type: none"> ■ No discernable difference with respect to geometric standards between alternatives. ■ Largest amount of additional property required beyond the Technically Preferred Route right-of-way. ■ Least impacts to the Marina and Silver Lakes Golf Course. ■ Constructability considered to be low complexity and no discernable difference between alternatives and various design constraints.
Traffic	<ul style="list-style-type: none"> ■ No weaving or safety concerns. 	<ul style="list-style-type: none"> ■ No weaving or safety concerns. 	<ul style="list-style-type: none"> ■ No weaving or safety concerns.
Structural	<ul style="list-style-type: none"> ■ Girder launching is feasible due to straight alignment. ■ Shallower superstructure due to simpler alignment. ■ Similar span arrangements for eastbound and westbound reduces design and fabrication costs. 	<ul style="list-style-type: none"> ■ Alignment results in constant horizontal bridge curvature which has slightly simpler design and fabrication than Alternative 2. ■ Curved alignment prohibits girder launching and results in deeper superstructure. 	<ul style="list-style-type: none"> ■ Alignment includes tangent and horizontal curves which slightly complicates design and construction. ■ Curved alignment prohibits girder launching and results in deeper superstructure.
Natural Environment Socio-Economic Environment Cultural Environment Indigenous Communities and Treaty Rights	<ul style="list-style-type: none"> ■ Directly impacts the Bradford Hill archaeological site. ■ High risk for in-water works requiring marine archaeology to further determine archaeological resources. ■ Direct impact to two recreation businesses, the Marina and Silver Lakes Golf Course. ■ Direct impact to an aerodrome. ■ Low and moderate risk for contamination along the alignment. ■ Alignment within the Greenbelt. ■ Interference with agricultural pond. ■ Small area of encroachment into the Holland Marsh Specialty Crop Area. ■ Direct impact to the marina bay and backwater area for fish habitat in a complex fish community (warmwater fish habitat). ■ Scour and erosion risk and footprint impacts into the river due to the alignment positioning relative to the river meander bends. ■ Direct impact to domestic well (Silver Lakes Golf Course). ■ Largest encroachment of the alignment through significant groundwater recharge areas compared to Alternative 1 and Alternative 2. 	<ul style="list-style-type: none"> ■ Avoids impacts to one significant archaeological site. ■ Lower risk for in-water works requiring marine archaeology to further determine archaeological resources. ■ Avoids direct impacts to two recreation businesses, the Marina and Silver Lakes Golf Course. ■ Direct impact to an aerodrome with greater impact. ■ Low and moderate risk for contamination along the alignment. ■ Alignment within the Greenbelt. ■ Smaller interference with agricultural pond. ■ Smaller area of encroachment into Holland Marsh Specialty Crop Area near 2nd Concession Road compared to Base Case and not significantly more encroachment than Alternative 2. ■ Avoids direct impact to the marina bay and backwater area for fish habitat in a complex fish community (warmwater fish habitat). ■ Scour and erosion risk and footprint impact into the river reduced due to alignment positioning relative to the river meander bends. ■ No direct impact to domestic well (golf course), adjacent to another domestic well. 	<ul style="list-style-type: none"> ■ Avoids impacts to one significant archaeological site. ■ Lower risk for in-water works, requiring marine archaeology to further determine archaeological resources. ■ Avoids direct impacts to two recreation businesses, the Marina and Silver Lakes Golf Course. ■ Direct impact to an aerodrome with greater impact. ■ Low and moderate risk for contamination along the alignment. ■ Alignment within the Greenbelt. ■ Smaller interference with agricultural pond. ■ Smallest area of encroachment into Holland Marsh Specialty Crop Area near 2nd Concession Road compared to Base Case and Alternative 1; not significantly less encroachment compared to Alternative 1. ■ Avoids direct impact to marina bay and backwater area for fish habitat in a complex fish community (warmwater fish habitat). ■ Scour and erosion risk and footprint impact into the river reduced due to alignment positioning relative to the river meander bends. ■ No direct impact to domestic well (golf course).

Evaluation Factors and Category	Base Case	Alternative 1 – Curved Transition	Alternative 2 – Tangent Transition
	<ul style="list-style-type: none"> ■ Vegetation removal resulting in edge impacts to deer wintering area, forested area, and wetlands (including Provincially Significant Wetlands). ■ Vegetation removal within potential Species at Risk habitat (edge). 	<ul style="list-style-type: none"> ■ Negligible difference of encroachment through significant groundwater recharge areas compared to Alternative 2, less than Base Case. ■ Vegetation removal with larger footprint into deer wintering area, forested area, and wetlands (including Provincially Significant Wetlands). ■ Larger vegetation removal within potential Species at Risk habitat (edge). 	<ul style="list-style-type: none"> ■ Direct impact to another domestic well compared to Alternative 1 and 2. ■ Negligible difference of encroachment through significant groundwater recharge areas compared to Alternative 1, less than Base Case. ■ Vegetation removal with larger footprint into deer wintering area, forested area and wetlands (including Provincially Significant Wetlands). ■ Larger vegetation removal within potential Species at Risk habitat (edge).
Preliminary Summary	<ul style="list-style-type: none"> ■ This Base Case is considered least preferred at this stage of the design compared to the other Alternatives being considered. The Base Case will be evaluated along with the Alternatives as the study is completed. The results of the evaluation and selection of the preferred design for the Updated Technically Preferred Route will be presented at Public Information Centre #2 and will be documented in the future Environmental Impact Assessment Report. 	<ul style="list-style-type: none"> ■ This Alternative is most preferred at this stage of the design and will be carried forward for further evaluation during this Preliminary Design study. As the Preliminary Design study progresses, a description of any measures proposed for mitigating any negative impacts (beyond those identified in Section 2) for the preferred design of the Updated Technically Preferred Route, that the change might have on the environment, will be noted at Public Information Centre #2 and will be documented in the future Environmental Impact Assessment Report. 	<ul style="list-style-type: none"> ■ This Alternative is moderately preferred at this stage of the design and will be carried forward for further evaluation during this Preliminary Design study. As the Preliminary Design study progresses, a description of any measures proposed for mitigating any negative impacts (beyond those identified in Section 2) for the preferred design of the Updated Technically Preferred Route, that the change might have on the environment, will be noted at Public Information Centre #2 and will be documented in the future Environmental Impact Assessment Report.

6. Summary of the Proposed Updated Technically Preferred Route, Potential Environmental Impacts and Proposed Mitigation Measures

In accordance with Section 16(2)(7) and 16(3)(a) of the Regulation, this section provides the following:

- a description of the proposed Updated Technically Preferred Route
- an assessment and evaluation of impacts that the changes may have on the environment
- a description of any proposed measures for mitigating any negative impacts that the change may have on the environment.

These changes are preliminary and will be refined further as the design and consultation progresses. A full impact assessment will be completed once the Preliminary Design is complete and the Updated Technically Preferred Route is confirmed. Details will be documented in the future Environmental Impact Assessment Report.

6.1 Proposed Updated Technically Preferred Route

As outlined in **Section 5.1** this report focuses on the proposed changes to the Technically Preferred Route that have been triggered by the changes to the environmental conditions in the Study Area since the 2002 Approved Environmental Assessment. **Table 5-2** outlines the proposed refinements to the Technically Preferred Route and identifies if the refinements were triggered by environmental conditions changes or design requirements (e.g., changes to design or safety standards). Of the 18 refinements listed, only two are considered changes to environmental conditions. The other 16 refinements are design related changes, and although design related changes can result in environmental changes, the environmental conditions are not the source of the trigger. Therefore, only direct changes in environmental conditions are outlined in **Section 5.2** of this report. Additional details on all proposed design refinements to the Technically Preferred Route will be documented in the future Environmental Impact Assessment Report.

6.2 Summary of Key Potential Environmental Impacts, Proposed Mitigation Measures, and Commitments

In accordance with Sections 16(3)(a) of the Regulation, this section identifies the key environmental issues and preliminary potential impacts for proposed changes to the Technically Preferred Route within the 2002 Environmental Assessment Study Area. It outlines the approach to documenting key recommended mitigation measures and commitments to be implemented as the Preliminary Design for this Study progresses. Where appropriate, preliminary commitments will be identified and documented in the Environmental Impact Assessment Report.

Table 6-1 provides a summary of environmental concerns, mitigation measures and commitments from the 2002 Approved Environmental Assessment and how the commitments are being carried forward to further design (if they are still applicable today). The first five columns in the table (highlighted in grey) have been extracted exactly from the 2002 Environmental Assessment Report, and only the far-right column has been updated to reflect how the commitment is being considered now in 2022 as time has evolved. It is important to note, that since 2002 many acts, legislations, standards, and guidelines have changed; therefore, some of the information presented in the first five columns may be out of date or refer to past government ministries that have now changed names.

In 2002 a Notice of Approval to Proceed with the Undertaking was issued (EA File No.: TCCE02), which included Conditions of approval. The 2002 Approval has been considered and associated conditions have been reflected in the Regulation, which came into force in October 2021.

Section 2 of this Draft Environmental Conditions Report provides initial details on factor-specific issues, constraints and recommendations. As the preliminary study advances, potential issues and concerns will be identified through the project-specific assessment of environmental impacts. Appropriate environmental mitigation measures will be developed, incorporated into the design and documented along with environmental commitments to future work. This assessment of environmental impacts will help to inform the future design and construction process. Where required, monitoring and inspection commitments will be established to verify the effectiveness of mitigation measures developed and implemented for the project. The commitments will include, but will not be limited to: design considerations to mitigate potential impacts through Detail Design; additional, new, or focused environmental and engineering design studies to reflect the outcomes of Preliminary Design studies, engineering design refinements, and legislative requirements; ongoing consultation and engagement, public notification of key project milestones; and provide a preliminary list of the permits, licences, authorizations, approvals and legislative requirements. The summary of key environmental concerns and commitments based on the Preliminary Design and current project-specific assessment of environmental impacts will be presented in the Environmental Impact Assessment Report.

Table 6-1: Summary of Environmental Concerns, Mitigation Measures and Commitments from the 2002 Approved Environmental Assessment Report

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
Traffic Operating Speed	<ul style="list-style-type: none"> Adequacy of facility to accommodate normal vehicle operating speeds 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> There are no segments of the route which fall below 140 km/h design speed. The direct ramps at the freeway-to-freeway interchanges use a 100 km/h design speed, thereby allowing smooth freeflow movement between facilities. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No commitments identified; however, traffic studies involving traffic modelling and analysis is being undertaken through Preliminary Design. The Bradford Bypass will be developed in accordance with current Ministry design and safety standards for posted speeds on urban or rural controlled access freeways. The Ministry may consider alternate design speeds for the freeway-to-freeway interchange ramps based on recent changes to highway posted speeds to meet the requirement for freeflow movement between the Bradford Bypass and both Highway 400 and Highway 404.
Traffic Operations	<ul style="list-style-type: none"> Adequacy of facility to accommodate future travel demand 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> The 400-404 Link (Bradford Bypass) will accommodate up to 4,000 - 4,500 vehicles per hour per direction; on a daily basis, capacity is in the 70,000 - 100,000 range. There will be considerable flexibility to accommodate seasonal peaks, temporary capacity reductions, peak recreational traffic demand and diverted traffic from congested alternate routes. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No commitments identified; however, traffic studies involving traffic modelling and analysis is being undertaken through Preliminary Design. This will be achieved through the configuration of the proposed Bradford Bypass.
Traffic Operations	<ul style="list-style-type: none"> Provide for adequate Level of Service for vehicular operations 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> The 400-404 Link is designed to provide a high standard of operational quality and safety to its users. The road profile grade has been limited to 3% and auxiliary (truck climbing) lanes have been included in the concept design. By attracting long distance and heavy truck traffic away from the municipal road network, traffic operations along those roads will be improved. Specifically, Queensville Sideroad, County Road 4 (former Highway 11), Holland Street, and Highway 88 will be relieved of a significant portion of through traffic, thereby reducing demand and improving Level of Service at signalized and unsignalized intersections along their length. 	<ul style="list-style-type: none"> All at-grade intersections at the interchange ramp terminals will be signal controlled if justified according to the provisions of the Ontario Manual of Uniform Traffic Control Devices 	<ul style="list-style-type: none"> In consideration for updates to Ministry design standards, the Ministry is reviewing the traffic control warrants for ramp terminals to apply appropriate location-specific traffic control measures. Therefore, a traffic study is being undertaken, and the project will be designed following current design and safety standards for maximum gradients for commercial vehicles. Signalized intersections, roundabouts and appropriate traffic control measures are being considered at interchange / road connections where warranted.

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
Safety	<ul style="list-style-type: none"> Design for safe operation of the facility 	<ul style="list-style-type: none"> Ministry of Transportation, Ontario Provincial Police 	<ul style="list-style-type: none"> The 400-404 Link will feature all standard safety provisions of the day for high-speed provincial freeways. The construction of the Bradford Bypass will result in a net reduction in vehicle accidents throughout the Study Area. 	<ul style="list-style-type: none"> The design features related to road safety (pier protection, barriers, illumination, etc.) will reflect fully the Provincial Design Standards and Policies in effect at the time of design. Use of the roadway by bicyclists, pedestrians, and slow-moving farm vehicles will be prohibited. Emergency routes will be maintained through retention of the existing road network, and improved by the presence of a new link in the road network. 	<ul style="list-style-type: none"> Preliminary Design study will review and apply current Provincial Design Standards and current policies for highway design safety standards. As a controlled access freeway, the Bradford Bypass will not permit use by bicycles or pedestrians. Where the design interacts with regional and municipal roads, the Ministry will consult with local municipalities to consider active transportation, including sidewalks, multi-use trail, multi-use paths that are proposed on local roads. Design considerations and consultation with emergency services is ongoing through Preliminary Design and future Detail Design. The design will consider access for emergency services through construction and the life cycle of the project.
Efficiency	<ul style="list-style-type: none"> Minimize out-of-way travel 	<ul style="list-style-type: none"> Ministry of Transportation, general public 	<ul style="list-style-type: none"> The Link will reduce out-of-way travel in the Study Area by providing a readily-accessed new link in the roadway network in a location where no direct east-west routes now exist. Travel on the new route will be high-speed, non-stop steady flow and the efficiency of some existing roads will also improve with the diversion of traffic to the new route. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No commitment identified; however, a traffic study is being undertaken, which will consider out-of-way travel.
Network Aspects	<ul style="list-style-type: none"> Provide for roadway community 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> The 400-404 Link will provide a consistent facility type for long distance traffic in the south Lake Simcoe area, and will bisect the gap for east-west travel in the provincial highway network between Highway 400 and the proposed extension of Highway 404. The existing municipal roads in the area of the link will be linked to the new route at key points, and all existing crossing roads will remain open. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No commitments identified; however, Highway 404 has now been extended to Woodbine Avenue northerly from its original termination from the Route Planning Study. The design does not involve the closure existing roadways. Design considers accommodations to existing roads and future road allowances such as the proposed extension to Professors Day Drive. Through Detail Design the Ministry will consider construction access and staging where the corridor interacts with existing roads. Much of the highway involves greenfield construction, which will have no impact on roadway access.

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
Financial	<ul style="list-style-type: none"> Affordability of roadway construction cost 	<ul style="list-style-type: none"> General public/ Ministry of Transportation 	<ul style="list-style-type: none"> The project will generate jobs during construction and travel time savings and other economic benefits for many years. 	<ul style="list-style-type: none"> A decision to proceed with construction will be made by the Minister of Transportation in light of the funds available and priority of other provincial projects that time. Construction can be staged so as to spread the investment over several years. 	<ul style="list-style-type: none"> To date, the County Road 4 Early Works project was awarded to a Design Build Contractor in Spring 2022. Detail Design and Construction of the Bradford Bypass is being prioritized and is subject to funding and approvals. As part of the design study, the Ministry is undergoing a Value Engineering study. A Value Engineering study is a systematic, organized method of design investigation led by a facilitator. A multi-disciplinary team investigates, and will analyze the functional requirements of a project, considering current standards and environmental constraints to recommend a design function at the lowest cost (capital, operating, maintenance, societal and environmental). Where appropriate, design recommendations generated through this study can be incorporated as part of the proposed design.
Construction	<ul style="list-style-type: none"> Constructability of the facility, particularly across the Holland River valley 	<ul style="list-style-type: none"> Ministry of Transportation, general public 	<ul style="list-style-type: none"> The Link crossings of the lowlands surrounding both branches of the Holland River will see a mixture of structure and fill. Structure footings will be on deep piled foundations. 	<ul style="list-style-type: none"> Detailed subsurface investigation along the route will be undertaken as part of the design phase, and embankment design and structural features will reflect the nature and composition of subsurface materials. 	<ul style="list-style-type: none"> The Ministry is carrying out geotechnical investigations to inform the structural foundation design, pavement design and understand the earth management and soil management requirements of the project. Through geotechnical investigations, groundwater data for conditions and characteristics will be collected. A Constructability Review workshop will be undertaken as part of the Preliminary Design study to assess and confirm constructability of the proposed design.

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
Staging	<ul style="list-style-type: none"> Ability to create early benefits, meet immediate needs, and defer expenditure through staged construction 	<ul style="list-style-type: none"> Ministry of Transportation, municipalities, general public 	<ul style="list-style-type: none"> Many of the goals of the project would be achieved with an initial two-lane roadway, and two-stage implementation would allow deferral of a significant proportion of the overall project cost. Conversely, if funding is not available for partial early implementation the result may be that when the project is finally constructed the travel demand at that time would warrant provision of the full four lane freeway and it would be built in a single stage. 	<ul style="list-style-type: none"> Within an overall stage, interim completion of sub-sections may be possible, allowing the early opening of completed segments. 	<ul style="list-style-type: none"> The approach considered advancement of Early Works as a sub-section of the project to advance as it accounted for design, construction and cost efficiencies with an existing project underway by the County of Simcoe. For the overall project, the Ministry is considering a two-lane Interim condition and an ultimate four-lane design, which includes one high-occupancy vehicle lane and three general purpose travel lanes in each direction. Interim and ultimate interchanges are being reviewed. No other Early Works, to advance sub-sections of the highway are identified, or specified under the Regulation.
General Commitment	<ul style="list-style-type: none"> High priority given to environmental work as design proceeds 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Minimal long term environmental impact of the Link through design and mitigation. 	<ul style="list-style-type: none"> At the outset of the design phase, the proponent will meet with Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority, and Fisheries and Oceans Canada staff to discuss concerns, review and update their work plan to current standards, policies, regulations, and approval requirements, and obtain any new information which may be applicable to the design phase. This will include an assessment of the federal Canadian Environmental Assessment Act requirements and any additional work necessary to finalize and implement the design for the undertaking. Prior to implementation, the proponent will identify design and construction details for the undertaking. This will include identification of the schedule, the construction activities, the impact of the activities upon adjacent lands or watercourses, and the mitigation that will be employed to minimize the impacts. The details of the construction activities will include the location of storage areas, 	<ul style="list-style-type: none"> In 2019, the Ministry advanced preparatory work to update the environmental conditions, which included initial consultation through information requests and reviews of current legislation. Consultation with agencies, including, but not limited to, the Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority, and Fisheries and Oceans Canada has occurred through Preliminary Design and is ongoing throughout the study. The Impact Assessment Agency of Canada reviewed the project in 2021 and the federal Minister of the Environment and Climate Change determined that the project does not warrant designation under the Impact Assessment Act. The Ministry is undertaking the following project-specific assessment of environmental impact studies: Agricultural Impact Assessment; Air Quality Impact Assessment; Archaeological Assessment; Cultural Heritage Assessment; Drainage and Hydrology; Erosion and Sediment Control Risk Assessment; Fish and Fish

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
				<p>equipment maintenance areas, dewatering areas, and access requirements.</p> <ul style="list-style-type: none"> ■ Appropriate mitigation will be developed by the proponent during the design phase and will be reviewed with Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority, and the federal agencies to address their concerns and legislative requirements prior to implementation. The following sections identify specific commitments to provide appropriate mitigation for the impacts resulting from the undertaking. Appropriate refers to mitigation that is both practical and reasonable given the site conditions and the degree of impact. Appropriate also recognizes and accepts that the mitigation for one factor may result in additional impacts to another factor. For example, the installation of fencing below grade to discourage wildlife movement will cause some disturbance to vegetation. 	<p>Habitat Impact Assessment; Fluvial Geomorphology; Groundwater Impact Assessment; Land Use and Property Impact Assessment; Noise and Vibration Impact Assessment; Snowdrift Assessment; Terrestrial Ecosystems Existing Impact Assessment (including an assessment of vegetation and vegetation communities, wildlife and wildlife habitat, species at risk and designated natural areas); screening of human health; and development of a Preliminary Landscape Composition Plan and Waste and Excess Materials Management Plan</p> <ul style="list-style-type: none"> ■ Completion of the Environmental Conditions Report and Environmental Impact Assessment Report under the Regulation to document the study and integrated consideration of environmental impacts, mitigation and commitments to future work for the project.
<p>Surface Water Systems</p>	<ul style="list-style-type: none"> ■ Minimize potential adverse impacts to surface water systems (physical characteristics, water quality and quantity) 	<ul style="list-style-type: none"> ■ Ministry of Transportation, Ministry of Natural Resources and Forestry, Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada, Lake Simcoe Region Conservation Authority, interest groups, general public 	<ul style="list-style-type: none"> ■ Long-span bridges will carry the proposed 400-404 Link across both branches of the Holland River. Other stream crossings will use appropriately designed culverts. ■ The continuity of the surface water system will be maintained. 	<ul style="list-style-type: none"> ■ Where appropriate: <ul style="list-style-type: none"> - design bridges and culverts that: <ul style="list-style-type: none"> ▪ maintain the existing channel form or include a low flow channel where appropriate ▪ do not impede fish movement ▪ do not place piers within the channel as defined by bankfull flow conditions, or are oriented in the direction of water flow to maximize hydraulic efficiency during high flow conditions ▪ minimize erosion and flood risk upstream and downstream of structure ▪ utilize open bottomed culverts in upwelling areas. - develop plans that minimize the disruption to natural systems and maintain slope stability when developing access roads for construction, including re-establishment or stabilization after construction. 	<ul style="list-style-type: none"> ■ Bridge and culvert designs are taking into consideration current information related to fish and fish habitat, fluvial geomorphology, hydrogeology, and surface water drainage studies. ■ Project-specific assessment of environmental impacts will provide recommendations to the design to avoid, minimize or mitigate potential impacts resulting from new or modified watercourse crossings and structures. ■ Where appropriate, environmental approvals will be sought under the Fisheries Act, Endangered Species Act, Ontario regulation 387/04, etc. ■ In addition, the Ministry will complete a Stormwater Management Plan, and Groundwater Protection and Well Monitoring Plan per the Regulation.

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Fisheries and Aquatic Habitat	<ul style="list-style-type: none"> Protect fish habitat during and following construction including no net loss of habitat 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Natural Resources and Forestry, Fisheries and Oceans Canada, Lake Simcoe Region Conservation Authority, interest groups, general public 	<ul style="list-style-type: none"> The 400-404 Link extends east-west and will cross several warmwater streams including two branches of the Holland River where there is the potential for a small loss of wetland area that may currently provide spawning habitat. Within the two affected watersheds (Holland River and Maskinonge River), a number or smaller streams and agricultural drains that provide or may provide habitat for migratory warmwater species and or resident baitfish populations will be affected. Key concerns during construction are the introduction of sediment, habitat disturbance and alteration of the stream banks and bed during structure placement. 	<ul style="list-style-type: none"> Where appropriate: <ul style="list-style-type: none"> develop a fish management plan that maintains or enhances fish habitat plans that maximize the riparian vegetation protection and the re-establishment as soon as possible after disturbance plans that provide for watercourse realignments in dry timing constraints to restrict construction activities immediately adjacent to or within watercourses to low flow months and that avoid sensitive spawning periods plans that minimize the disruption to natural systems and maintain slope stability when developing access roads for construction, including re-establishment or stabilization after construction. 	<ul style="list-style-type: none"> The project will be assessed in accordance with the Interim Environmental Guide for Fisheries (Ministry of Transportation, 2020) and the Pilot Ministry of Transportation / Fisheries and Oceans Canada / Ministry of Natural Resources and Forestry Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, Version 4 (2020). Environmental management plans related to fish and fish habitat will be developed as required in accordance with the Fisheries Act.
Vegetation	<ul style="list-style-type: none"> Removal and/or disturbance of vegetation and flora, along with fragmentation of large woodland blocks 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Natural Resources and Forestry, interest groups, general public 	<ul style="list-style-type: none"> Where possible, larger blocks of vegetation were avoided. However, 22.1 hectares of higher quality woodlands will be removed. The total area of the Holland Marsh Endangered Species Act affected by the proposed facility is 17.2 hectares. The impact will not affect the status of the Endangered Species Act. The Recommended Plan was routed, where possible, to areas of existing openings, areas of previous disturbance, or along the edge of vegetative blocks. 	<ul style="list-style-type: none"> Where appropriate: <ul style="list-style-type: none"> edge management plans for areas of new disturbance to protect remaining trees and re-establish edge salvage of existing native vegetation, seed, and topsoil for re-establishment in identified areas of significant disturbance relocate rare, threatened or endangered plant species minimize disturbance to remaining vegetation by felling trees into the working easement, and leaving stumps and roots for soil stabilization and natural regeneration, and restricting access with fencing to working areas maximize forest regeneration opportunities on lands which are surplus to transportation needs as mitigation for fragmentation of significant vegetation and to provide linkage to alternate habitat vegetation removal and protection of residual vegetation should be completed in accordance with Ontario Provincial Standard Specifications. 	<ul style="list-style-type: none"> The Ministry will assess potential impacts to vegetation, wildlife habitat and sensitive natural areas to propose appropriate mitigation measures to avoid, minimize and mitigate potential impacts to natural areas along the Technically Preferred Route, and Updated Technically Preferred Route. As a commitment, the Ministry shall consider environmental management plans such as an Edge Management Plan, which may be a standalone plan, or incorporated into other plans such as clearing and grubbing plans, access management plans, or a specific plan that may be a condition of approval for the proposed works.

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<p>Wetlands</p>	<ul style="list-style-type: none"> ■ Crossing of the Holland Marsh Wetland Complex 	<ul style="list-style-type: none"> ■ Ministry of Transportation, Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority, Ministry of the Environment, Conservation and Parks, interest groups, general public 	<ul style="list-style-type: none"> ■ 9.5 hectares of Provincially Significant Wetlands will be crossed by the right-of-way; the remaining 8.9 hectares are composed of marsh and swamp community types. The above figures refer to the total land area taken by the 100 metres right-of-way to be designated for the route. In fact, the direct physical impacts will be significantly less and will be limited to the construction of widely separated bridge piers. ■ Fens are the most sensitive land use types along the route, being dependent on the shallow lateral movement of groundwater. Only a small area of degraded fen is potentially affected. 	<ul style="list-style-type: none"> ■ Maintaining of the volume and pattern of water flow through the wetland (both surface water and groundwater) and the post-construction restoration of areas affected by construction related activities will be a focal point of the migration efforts. ■ Commitments include, where appropriate: <ul style="list-style-type: none"> - develop restoration plans for areas of wetland temporarily disturbed by construction installation of equalizer culverts to preserve dynamics of wetland hydrology by maintaining sheet flow through the wetland and facilitating wildlife crossing for small mammals and amphibians - delineation of areas to be protected with sediment fences to prevent intrusion during construction - timing constraints that restrict construction activities immediately adjacent to or within wetlands to respect the intent of the federal Migratory Bird Regulations (1994) and the Ontario Game and Fish Act (1980) - salvage of wetland plant material to be used for re-establishment in identified areas of significant disturbance - minimization of dewatering within wetlands and irrigation to maximize survival in disturbed areas that will be re-established - retention of lands which are surplus to transportation needs for the purpose of mitigation by allowing reversion to wetland. ■ The Ministry has committed to construct the facility as an elevated pier structure through the Provincially Significant Wetlands. Emphasis will be placed on minimizing backwater effects and maintaining groundwater flows and patterns, thereby minimizing longer term effects on the fen wetland type. 	<ul style="list-style-type: none"> ■ Through the project-specific assessment of environmental impacts, the Ministry will complete a Terrestrial Ecosystem Impact Assessment, drainage and hydrology study, stormwater management plan, hydrogeology study, and develop a preliminary landscape design plan. ■ The proposed design will consider potential impacts to wetlands, wildlife habitat, wildlife (including wildlife passage), erosion and sediment control measures, access management for spatial and temporal constraints, landscape and ecological restoration and legislative requirements. ■ Through the study consultation with the Ministry of Natural Resources and Forestry and Ministry of Environment, Conservation and Parks for wetlands, wildlife, sensitive natural areas and protection of sensitive species will be carried out. Consultation with Lake Simcoe Region Conservation Authority and Nottawasaga Valley Conservation Authority will also occur, to consider watershed specific environmental constraints and restoration recommendations.

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				<ul style="list-style-type: none"> ■ Monitoring of all activities in the wetland along with ongoing site review efforts with the responsible agencies will be key elements of the design and construction process. Where feasible, wetland substrates will be salvaged for use in stormwater management facilities (e.g., substrate and seed bank for wetland creation in SWM ponds). ■ Where other wetlands are encountered, similar mitigative measures will be employed. Efforts will be made to ensure, by way of the road design, that surface water drainage and shallow groundwater patterns are not subjected to major alterations. 	
<p>Wildlife</p>	<ul style="list-style-type: none"> ■ Minimize wildlife habitat disturbance, minimize fragmentation of large habitat blocks and maintenance of wildlife corridors 	<ul style="list-style-type: none"> ■ Ministry of Transportation, Ministry of Natural Resources and Forestry, interest groups, general public 	<ul style="list-style-type: none"> ■ The proposed 400-404 Link will remove 23.7 hectares of significant wildlife habitat, potentially affect two Provincially and Nationally "vulnerable" species (Louisiana Waterthrush and Red-shouldered Hawk) currently nesting in proximity to the recommended plan, and potentially interrupt wildlife movement along some stream corridors and woodlots, particularly in the area between Highway 400 and Simcoe County Road 4 (Highway 11). 	<ul style="list-style-type: none"> ■ By using available openings skirting the large woodland blocks in the Holland River floodplain and using disturbed edge location, habitat fragmentation in that area is minimized. ■ The proposed long-span bridge across the Holland River branches will retain wildlife movement opportunities along the riverbanks. ■ The drainage plan will minimize the ponding of salt-laden runoff, and decrease impacts on sensitive aquatic habitat for breeding amphibians and other species. To minimize road kills, measures will include a wide, grassed, open, median, fencing of the right-of-way, provision of good visibility for drivers, and the consideration of cautionary wildlife crossing signage. ■ Commitments include, where appropriate: <ul style="list-style-type: none"> - design bridges and culverts that accommodate terrestrial passage for small mammals at identified locations within specified wildlife corridors; - restrict clearing of trees immediately adjacent to or within significant breeding areas to non-critical periods; and - monitor wildlife movement patterns and potential of conflict. 	<ul style="list-style-type: none"> ■ Bridge designs for the crossing of the Holland River and Holland River East Branch will consider environmental constraints including, but not limited to terrestrial ecosystem, including sensitive species and wetlands, fish and fish habitat, archaeological resources, floodplain modelling, and stormwater management.

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Groundwater	<ul style="list-style-type: none"> Potential well impacts and contamination of/interference with groundwater resources 	<ul style="list-style-type: none"> Ministry of Transportation, local municipalities, property owners 	<ul style="list-style-type: none"> 24 domestic wells are potentially affected either directly (i.e., removal) or indirectly (i.e., potential interference) by the proposed Link. In the area of sandy soils associated with the Holland River, shallow perched groundwater system is susceptible to contamination and/or interference. The Bradford municipal well west of the Holland River will be avoided and otherwise unaffected by the proposed roadway. 	<ul style="list-style-type: none"> Tiling of soil in non-vegetated areas prior to restoration to re-establish infiltration along access roads, storage areas, or other well travelled areas where soil compaction has occurred in areas that previously permitted infiltrating; Backfilling of excavations that intercept existing groundwater flow with porous granular material to maintain existing groundwater linkage particularly at river crossings; Detailed stormwater management plans which address both quantity and quality; A well monitoring program which will involve pre-construction testing, investigation of complaints during construction, and provision of an alternate water supply; and Use of appropriate dewatering and spills avoidance management techniques. 	<ul style="list-style-type: none"> The Ministry shall complete and prepare a Stormwater Management Plan and a Groundwater Protection and Well Monitoring Plan per the Regulation. As a result of the project-specific assessment of environmental impacts, design and construction plans will consider, erosion and sediment control requirements, access management, clearing and grubbing, earth management and landscape and ecological restoration.
Greenways and Open Space Linkages	<ul style="list-style-type: none"> Minimize the disruption to existing greenways/natural corridors 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Natural Resources and Forestry, York Region, general public 	<ul style="list-style-type: none"> The Link is an east-west route traversing a landscape in which the main natural features are on a north-south axis particularly in the centre of the study area, namely, the two branches of the Holland River and the associated wetlands and upland forest Where possible, the Link alignment skirts the edges of contiguous forest blocks or follows existing gaps in the forest. Between the CN rail line and Yonge Street, an area that is predominantly naturally vegetated, the route will be on a pier structure for more than one quarter of its length, thereby providing opportunities to maintain the natural corridor function. Similarly, where the Link crosses both branches of the Holland River and its associated wetlands it will be on a pier structure. 	<ul style="list-style-type: none"> Mitigative efforts will be focused on the restoration of natural vegetation disturbed by construction-related activities, thereby ensuring the continuity of the natural vegetation within the central portion of the study area. 	<ul style="list-style-type: none"> The preliminary landscape design plan and future landscape and ecological restoration will consider recommendations, mitigation measures and commitments identified through the project-specific assessment of environmental impacts (ecological, social and cultural), environmental legislative requirements, and aesthetics.

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Soil	<ul style="list-style-type: none"> Minimize the areas of high capability mineral soils (Class 1, 2, 3, 4) and agricultural organic (muck) soils removed 	<ul style="list-style-type: none"> Ministry of Transportation, Ontario Ministry of Agriculture, Food and Rural Affairs, agricultural property owners, general public 	<ul style="list-style-type: none"> In the segments of the study area to the west of the Holland River basin and east of the ridge formation the soils are consistently high capability loam and silty clay loam (Class 1, 2, 3, 4) and there are no distinct areas of lower capability soils where an alternative alignment would have a lesser impact. The proposed Link will remove 190.37 hectares of high capability mineral soils from potential agricultural use. Between the river branches the soils include poorly drained shallow sandy soil (Class 4) and organic soils, both with excessive water limitations. The underlying clay is evident within the plough layer in some locations indicating that the depth of the organic deposits is being depleted. The proposed Link alignment utilizes an area of previous disturbance (Hochreiter Road) thereby minimizing although not eliminating impact; 9.3 hectares of organic (muck) soil are removed by the proposed Link. 	<ul style="list-style-type: none"> There are no areas where lower capability soils provide a reasonable alternative route. The loss of higher capability soils in unavoidable. The area taken has thus been minimized. 	<ul style="list-style-type: none"> Geotechnical investigations are being carried out to understand the sub-surface conditions and inform the structural foundation and pavement design for the project. The project will consider soil and groundwater conditions to develop earth and soil management plans with respect to contaminated soils, and apply a groundwater protection and well monitoring plan to the project. To understand and consider soil conditions as they relate to agricultural soils, an Agriculture Impact Assessment is being completed.
Aesthetics	<ul style="list-style-type: none"> Minimize visual intrusion and maximize attractiveness of new roadway 	<ul style="list-style-type: none"> Ministry of Transportation, area residents 	<ul style="list-style-type: none"> The route avoids one of the most sensitive areas in terms of visual impact - the Scanlon Creek Conservation Area - and the woodlots adjacent to the route in the Holland River lowlands will screen most medium-to-long views of the embankment and long bridges. Further expansion of urban development north of 8th Line will likely serve to screen the view of the facility from most existing residences. The long view from the hillside residential area north of Bradford (Grandview Estates) can not be screened. The effect on downtown Bradford of the reduction of through traffic and heavy trucks from the main commercial arteries; 	<ul style="list-style-type: none"> In open rural territory the freeway will be visible; it is in such areas that landscaping within the right-of-way should be considered. The two river crossing structures will be designed in an aesthetically pleasing manner using clean, simple, low-profile lines, long spans, and tapered piers; visual appeal to motorists and to those who may see the bridge from below will be a significant factor in selecting and detailing the bridge design. 	<ul style="list-style-type: none"> The Ministry will develop a preliminary landscape design plan for the corridor. The landscape design shall consider ecological site restoration, snow drift mitigation, noise mitigation, municipal landscaping and aesthetics.

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			<p>this is a key element in the local Heritage Environmental Agricultural Recreational Tourism Committee's efforts to revitalize and beautify the downtown.</p> <ul style="list-style-type: none"> ■ Another viewing highlight will be presented to Link users on the approaches to the Holland River valley, as dramatic vistas open up to eastbound travelers as they approach County Road 4 and to westbound motorists as they crest the beach ridge west of Leslie Street. 		
<p>Highway Construction Noise</p>	<ul style="list-style-type: none"> ■ Minimize impact of noise generated by the new highway on nearby residential areas 	<ul style="list-style-type: none"> ■ Ministry of Transportation, Ministry of the Environment, Conservation and Parks, municipalities, area residents 	<ul style="list-style-type: none"> ■ Approximately 49 of the 2014 homes currently within 600 metres of the proposed alignment will experience noise level increases greater than 5 dBA. 	<ul style="list-style-type: none"> ■ Ministry policy indicates that where increases exceed 5 dBA: <ul style="list-style-type: none"> - investigate noise control measures within the right-of-way - if project cost is not significantly affected, introduce noise control measures within the right-of-way ■ Noise control measures where introduced, should achieve a minimum of dBA attenuation averaged over the first row of receivers (NSAs) ■ Mitigation measures relating to noise and vibration will be documented in a Design and Construction Report ■ With regard to construction noise, at the design stage, the Ministry will carry out the following commitments: <ul style="list-style-type: none"> ■ Noise sensitive areas will be identified ■ Applicable municipal noise control by-laws will be identified. Where timing constraints, or any other municipal by-law may cause hardship to Ministry, an exemption will be sought. ■ An initial complain from the public will require verification by Ministry that the general noise control measures agreed to are in effect; Ministry will investigate all noise concerns, warn the contractor of any problems, and enforce its contract 	<ul style="list-style-type: none"> ■ A Noise and Vibration Impact Assessment is being undertaken in accordance with the Ministry of Transportation's Environmental Guide for Noise (2022). Noise Sensitive Areas will be identified and an assessment of potential impacts will be completed. Where vibration concerns have been raised, considerations through design and construction will be factored into the environmental commitments for the project. ■ Preparation of a Noise Report per the Regulation. ■ Construction related noise and measures to avoid, minimize or mitigate noise generated during construction will be applied. Where appropriate, municipal noise by-laws will be applied to the project. ■ A human health screening during Preliminary Design will consider the results of the noise study.

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				<ul style="list-style-type: none"> ■ Notwithstanding compliance with the "general noise control measures", a persistent complaint will require a contractor to comply with Ministry of the Environment, Conservation and Parks sound level criteria for construction equipment contained in the Ministry of the Environment, Conservation and Parks Model Municipal Noise Control By-Law. Subject to the results of field investigation, alternative noise control measures will be required, where these are reasonably available. ■ In selecting the appropriate construction noise control and mitigation measures, Ministry will give consideration to the technical, administrative, and economic feasibility of the various alternatives. ■ Where pile driving or blasting may be necessary in noise sensitive areas monitoring will be determined an adopted Ministry policy pursuant to prevailing provincial legislation at the time of construction. 	
Community Effects	<ul style="list-style-type: none"> ■ Minimize the negative impact of the new road on homes, community features, and recreational areas/practices 	<ul style="list-style-type: none"> ■ Ministry of Transportation, municipalities, interest groups, area residents, general public 	<ul style="list-style-type: none"> ■ Homes: <ul style="list-style-type: none"> - By travelling mid-concession and utilizing available gaps in the developed countryside, the number of individual homes within the 15.3 kilometres long Link right-of-way was kept to 6 (two each at Younge Street, Bathurst Street and County Road 4). ■ Community Features: <ul style="list-style-type: none"> - The new route avoids entirely the area's community features such as schools, churches, cemeteries, parks and other public facilities. In improving access to Bradford and providing a new link across the Holland River valley, the facility will improve the attractiveness of existing facilities. 	<ul style="list-style-type: none"> ■ Where the bridge passes by Albert's Marina particular attention will need to be paid to mitigation of noise and visual intrusion on marina users in the design phase (e.g., Location/elimination of expansion joints, pier and substructure aesthetics, road surface drainage, noise deflectors, etc.). Similar consideration will need to be given to the facility design in the vicinity of Silver Lakes Golf Course. 	<ul style="list-style-type: none"> ■ The Ministry has reviewed the Technically Preferred Route and developed alignment alternatives at this location, which along with considerations for other environmental constraints, will provide greater separation from these recreational facilities. ■ A Noise and Vibration Impact Assessment and a Preliminary Landscape Composition Plan will be prepared to assess potential impacts and identify proposed mitigation measures if required.

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			<ul style="list-style-type: none"> ■ Recreational Areas/Practices: <ul style="list-style-type: none"> - The Link avoids the Scanlon Creek Conservation Area. The long-span high level bridges across the two river branches will allow continuation of all water-based recreational activity such as boating, canoeing, fishing and birdwatching. 		
Agriculture	<ul style="list-style-type: none"> ■ Preserve agriculture land and minimizing negative impacts on agricultural operations 	<ul style="list-style-type: none"> ■ Ministry of Transportation, Ontario Ministry of Agriculture, Food and Rural Affairs, agricultural property owners, general public 	<ul style="list-style-type: none"> ■ Thirteen field crop and three livestock farming operations are affected by the proposed facility in the west section. ■ Seven specialty crop, three livestock and five field crop operations are directly affected by the proposed Link in the east and central sections. ■ The total land area, currently in active agricultural production, directly affected by the proposed facility is 84.4 hectares in the western section and 69.9 hectares in the east and central section totaling 154.3 hectares 	<ul style="list-style-type: none"> ■ To minimize the negative effects of the route on agricultural operations and avoid major severances, the alignment is located mid-concession where possible, or along existing lot lines. 	<ul style="list-style-type: none"> ■ An Agriculture Impact Assessment is being prepared to assess potential impacts to agricultural operations. ■ Refinements and adjustments to the alignment will be identified and evaluated using a reasoned argument (trade-off) method to consider advantages and disadvantages to an alternative, including those related to agricultural lands and operations.
Commercial / Industrial	<ul style="list-style-type: none"> ■ Enhance commercial/ industrial sector while minimizing negative impact on local businesses, particularly downtown Bradford 	<ul style="list-style-type: none"> ■ Ministry of Transportation, municipalities, interest groups 	<ul style="list-style-type: none"> ■ By the time of the Link construction it would have little net negative effect on the economic viability of the town, and would in fact support commercial/industrial growth through improved access to the provincial freeway system and reduced truck use of local streets. ■ The route passes through the two lots on Artesian Industrial Parkway currently occupied by commercial businesses; they could be relocated to undeveloped lots nearby. The link will also impact property occupied by parts of Albert's Marina and the Silver Lakes Golf Club on either side of the Holland River East Bach, but the functional and economic viability of both enterprises will remain. 	<ul style="list-style-type: none"> ■ Part of the freeway plan will include signage orienting traffic towards downtown Bradford where appropriate. ■ Consultation with Albert's Marina and Silver Lakes Golf Club will be necessary during the design stage to minimize impacts to each business; some reconfiguration of the facilities within each property will be needed. 	<ul style="list-style-type: none"> ■ Highway signage will be developed in accordance with current Ministry standards, guidelines and policies. ■ Through the Preliminary Design alternative alignments are being considered to minimize potential impacts to ecological, cultural and socio-economic areas, which include the two recreational facilities on the banks of the Holland River East Branch. Consultation with property owners is ongoing to consider potential impacts to property and the function of these facilities.

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Property Waste and Contamination	<ul style="list-style-type: none"> Avoidance of waste/contaminated sites 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> The Link alignment avoids the only known landfill site in the Study Area (north side of 8th Line, west of the CN Rail line). However, it is possible that landfill waste or other contamination may be discovered during subsequent design or construction phases. 	<ul style="list-style-type: none"> Any waste material or contaminated soils encountered will be managed in accordance with the requirements of applicable legislation, such as the Environmental Protection Act, and with applicable guidelines such as the Ministry of the Environment, Conservation and Parks Guidelines for Use at Contaminated Sites in Ontario. Measures to ease the contaminant of accidental spills will be considered in the design of stormwater management facilities for the Link 	<ul style="list-style-type: none"> Sub-surface conditions, including soil characteristics related contamination, and designated substances is being considered. A Waste and Excess Materials Management Plan will be prepared based on the geotechnical conditions and laboratory results of soil sampling. Groundwater monitoring wells have been installed to understand the groundwater characteristics, including the presence of designated substances that may be present within the Study Area. These hydrogeological results will inform future water taking permits and the groundwater protection and well monitoring plan for the project. The Stormwater Management Plan will consider spills management during construction and stormwater management for the project lifecycle.
Aggregates	<ul style="list-style-type: none"> Avoidance of taking aggregate deposits out of current or potential production 	<ul style="list-style-type: none"> Ministry of Transportation 	<ul style="list-style-type: none"> There are no significant aggregate deposits on or adjacent to the Link right-of-way. A significant quantity of imported fill will be required for the Link roadbed. 	<ul style="list-style-type: none"> Construction of the Link will support aggregate production in nearby pits and quarries. 	<ul style="list-style-type: none"> Commitment carried forward.
Archaeology	<ul style="list-style-type: none"> Avoidance of known or potential sites of archaeological significance 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Citizenship and Multiculturalism, interest groups, general public 	<ul style="list-style-type: none"> The route passes well to the north of the early 19th century steamboat landing and transshipment point. A significant prehistoric/early historic site was discovered partly within the proposed right-of-way. The potential exists for other undiscovered archaeological sites at the Holland River East Branch and elsewhere within the proposed freeway right-of way. 	<ul style="list-style-type: none"> Once the specific nature and extent of archaeological resources impacted by the highway are identified, appropriate mitigation measures will be developed in accordance with the Ministry of Transportation/Ministry of Citizenship and Multiculturalism guidelines. 	<ul style="list-style-type: none"> Stage 2, 3 and 4 Archaeological Assessments are ongoing. Stage 3 archaeological assessment will be completed per the Regulation. Where appropriate, the following recommendations will be applied to the project based on the assessment of the discovered archaeological resource: <ul style="list-style-type: none"> Design refinement - Avoidance Construction Monitoring Stage 4 Mitigation
Historical	<ul style="list-style-type: none"> Minimize impact on significant historical elements of the built environment 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Citizenship and Multiculturalism, interest groups, property owners, general public 	<ul style="list-style-type: none"> No significant historical buildings and features are directly affected (within the right-of-way). One historically significant home (near Simcoe County Road 4) is within 100 metres of the route. 	<ul style="list-style-type: none"> Mitigation of visual impact of the Link through landscaping and other options will be investigated where appropriate. 	<ul style="list-style-type: none"> Cultural Heritage Evaluation Reports and Heritage Impact Assessments are being prepared as required to assess potential impacts to historical structures and landscapes. Preliminary landscape design will consider historical landscapes where appropriate.

Factor / Criterion	Issue	Concerned Group / Agency	Potential Net Environmental Effect (as taken from 2002 Approved Environmental Report)	Proposed Mitigation / Commitments to Future Work (as taken from 2002 Approved Environmental Report)	Description of Commitment Carried Forward through Preliminary Design
Stormwater Management	<ul style="list-style-type: none"> Management of roadway runoff and stormwater so as to reduce impacts to the quality and quantity of surface and groundwater 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority 	<ul style="list-style-type: none"> Stormwater runoff has the potential to severely impact the quality and quantity of surface and groundwater. 	<ul style="list-style-type: none"> The objectives of the Plan will include: When designing Stormwater Management Practices, consideration will be given to measures for reducing adverse environmental impacts to surface and groundwater. Bridge runoff should be discharged to stormwater management facilities (preferably a pond or swale) prior to discharge to watercourses where this reasonably can be achieved and will not cause unacceptable environmental, highway design, safety or operational problems. 	<ul style="list-style-type: none"> The Ministry will prepare a Stormwater Management Plan The Ministry is consulting with lake Simcoe Conservation Authority and Nottawasaga Valley Conservation Authority through Preliminary Design to inform the surface water, hydrology study and stormwater management plan. The design will incorporate their recommendations and current environmental legislation and guidelines for design and construction of the project.
Erosion and Sediment Control	<ul style="list-style-type: none"> Protection of terrestrial and aquatic resources through limitation of soil erosion and sedimentation 	<ul style="list-style-type: none"> Ministry of Transportation, Ministry of Natural Resources and Forestry, Lake Simcoe Region Conservation Authority 	<ul style="list-style-type: none"> Soil erosion and sedimentation can potentially harm terrestrial and aquatic resources. 	<ul style="list-style-type: none"> The identified right-of-way for the Link has been checked at locations of deep cut and fill to ensure that adequate property is shown to accommodate slope benching. Mitigation will include contract specifications that require the preparation of sedimentation and erosion control plans, which provide the details of implementation, monitoring, and commitment to undertake modifications where necessary during construction to maintain effectiveness. 	<ul style="list-style-type: none"> The Highway design is reviewing profile optimization to minimize cut and fill requirements, and design the appropriate grading for the project. Where appropriate, slope benching, retaining walls, and reinforced soils slope walls will be designed and applied to the project as a mechanical stabilizing measure. Geotechnical investigations will inform the design, as well as completion of an Erosion and Sediment Control Risk Assessment, Earth Management Plan, and landscape design plans.
Sustainable Development	<ul style="list-style-type: none"> Avoidance of contributing to unsustainable development patterns 	<ul style="list-style-type: none"> Ministry of Transportation, general public 	<ul style="list-style-type: none"> In supporting mobility of people and goods and in supporting the economic development of the study area (Bradford in particular), the Link may contribute to a reduction in dependence on long-distance commuting for residents of northern York Region as a significant proportion currently travel to jobs outside the area. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> No commitments identified; however, The Ministry will complete a Traffic study and consult with the County of Simcoe, Regional Municipality of York, Bradford West Gwillimbury, King Township and East Gwillimbury to consider traffic management plans, official plans and the future growth and development of the area. In addition, the Ministry will consider feedback received from businesses, agricultural operations and key stakeholders to understand the socio-economic environment that will be serviced by the proposed highway.

7. Correspondence During Public Review Period

As outlined in Section 4, and in accordance with Section 18 of Ontario Regulation 697/21, the Draft Environmental Conditions Report was available for a public review period between August 12 and September 16, 2022. Further consultation with individual stakeholders took place, as required.

The Final Environmental Conditions Report has been updated to include:

- A description of any concerns raised by Indigenous Communities and interested persons
- A description of what, if anything, the proponent did or will do in respect to the concerns raised, and
- A description of any changes to the Environmental Conditions Report as a result of addressing concerns raised during consultation under Section 18.

In accordance with Section 19 of Ontario Regulation 697/21, **Table 7-1** provides a record of consultation received during the public review period of the Draft Environmental Conditions Report and Project Team actions. Correspondence received during the public review period of the Draft Environmental Conditions Report along with Project Team responses has been added to the Record of Consultation available in **Appendix B**.

Table 7-1: Correspondence Received During the Draft Environmental Conditions Report Public Review Period

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
General Report Updates	■ N/A	■ N/A	<ul style="list-style-type: none"> ■ Revision of Draft Environmental Conditions Report to Final Environmental Conditions Report. ■ Revision of the date to reflect the posting of Final Environmental Conditions Report. ■ Inclusion of Section 19 of Ontario Regulation 697/21 to Table ES-1 and Table 1-2. ■ Inclusion of the Notice of Publication Final Environmental Conditions Report in Table 4-1. ■ Addition of Section 7 as per Section 19 of Ontario Regulation 697/21. ■ Report formatting for compliance with Accessibility for Ontarians with Disabilities Act requirements. ■ Summary of meetings with Indigenous Communities on July 29, August 23 and September 8, 2022 added to Table 4-2. ■ Summary of meeting with King Township on August 24, 2022 added to Table 4-3. ■ Revised Ministry of Tourism, Culture and Sport to the new name of Ministry of Citizenship and Multiculturalism.
Indigenous Nation – The Metis Nation Registry	■ Updates to contact information	■ Request to update email address.	■ Email address has been updated.
Indigenous Nation- Williams Treaty	■ Updates to contact information	■ Request to add staff information to the Project Contact List.	■ Staff information was added to Project Contact List.
Municipality- Township of King	■ Updates to contact information	■ Request to add staff information to the Project Contact List.	■ Staff information was added to Project Contact List.
Municipality- East Gwillimbury	■ Access to Draft Environmental Conditions Report	■ Requested a link to the Draft Environmental Conditions on the Project Website.	<ul style="list-style-type: none"> ■ The posting of the Draft Environmental Conditions Report has been delayed and will be made available shortly. ■ Confirmation that the Draft Environmental Conditions Report is now available on the Project Website.
Agency- CN Rail	■ Updates to contact information	■ Request to update email address.	■ Email address was updated.
Agency- Infrastructure Ontario	■ Impacts to property	■ Request to verify if provincial government property is within the Study Area.	■ Confirmation that provincial government properties within the Study Area are owned by the Ministry.
Agency- Ministry of Citizenship and Multiculturalism	■ Technical Reports	■ Unable to provide meaningful comments on the draft Environmental Conditions Report without the updated Cultural Heritage Resource Assessment Report and Stage 1 Archaeology Report	■ Confirmation the 2020 Cultural Heritage Resource Assessment Report and Stage 1 Archaeology Report are being updated and will be submitted to the Ministry of Citizenship and Multiculturalism upon completion.

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Agency- Ministry of Natural Resources and Forestry	<ul style="list-style-type: none"> ■ Terrestrial Ecosystems 	<ul style="list-style-type: none"> ■ Requested to include the Lake Simcoe Protection Plan in the Environmental Conditions Report. ■ Request to clarify the term Designated Natural Areas. ■ Requested for a discussion on Significant Woodlands be included in the Environmental Conditions Report. ■ Requested A Place to Grow: Growth Plan for the Greater Golden Horseshoe be included in the Environmental Conditions Report. ■ Suggested updates to mapping regarding deer wintering areas, vegetation communities, ■ Suggestions for field surveys for candidate Significant Wildlife Habitats. ■ Suggestions regarding natural heritage communities and hydraulic features near the East Holland River Crossing. ■ Suggestion to include the area of Provincially Significant Wetlands and Significant Wildlife Habitats impacted by the project. 	<ul style="list-style-type: none"> ■ Inclusion of the Lake Simcoe Protection Plan in Section 1.5.3.1.4. ■ Clarified the term Designated Natural Areas and included explanation in Section 2.1.1.3.1 noting that the term is consistent with the Ministry’s Environmental Reference for Highway Design. ■ Text regarding Significant Woodlands included in Section 2.1.1.3.2. ■ Confirmation that A Place to Grow: Growth Plan for the Greater Golden Horseshoe is provided in Section 1.5.3.1.1. ■ Updates to Figure 2-1 and Figure 2-2. ■ Confirmation that a future Terrestrial Ecosystems Impact Assessment will consider impacts to both confirmed and candidate Significant Wildlife Habitats. ■ Confirmation that design refinements for the project alignment and the Holland River Crossing involved consideration of the commitments and recommendations from the 2002 Approved Environmental Assessment, as well identified impacts to fish habitat, a known archaeological site, and socio-economic impacts to the Albert’s Marina and Silver Lakes Golf and Country Club. ■ Confirmation that a future Terrestrial Ecosystems Impact Assessment will consider impacts to Provincially Significant Wetlands and Significant Wildlife Habitats, and will be documented in the Environmental Impact Assessment Report. .
Agency- Ministry of Natural Resources and Forestry	<ul style="list-style-type: none"> ■ Fish and Fish Habitat 	<ul style="list-style-type: none"> ■ Requested the Fish and Wildlife Conservation Act be included in the Environmental Conditions Report. ■ Provided suggestions regarding fisheries, crossings, and in-water works. ■ Suggested edits to Appendix A. 	<ul style="list-style-type: none"> ■ Inclusion of the Fish and Wildlife Conservation Act in Table 1-3. ■ Acknowledgement of comments and suggestions and noted that any in-water works will be completed by a qualified professional during construction. ■ Updates to Appendix A to reflect the Ministry of Natural Resources and Forestry’s comments.
Agency-Lake Simcoe Region Conservation Authority	<ul style="list-style-type: none"> ■ Natural Heritage 	<ul style="list-style-type: none"> ■ Suggested updates to Environmental Conditions Report to update the information in the Terrestrials Ecosystems and Fish and Fish Habitat sections. ■ Suggested that the locations of regional and provincially rare plants should be provided in Ecological Land Classification mapping ■ Recommendation that targeted surveys for Species at Risk should be undertaken ■ Concerns regarding the fish habitat assessments taken in June are too late to capture the spring freshet and spawning and therefore a “not fish habitat” classification is invalid. ■ Request to include Lake Simcoe Region Conservations Authority fish data in the background review. 	<ul style="list-style-type: none"> ■ Confirmation that the Terrestrial Ecosystems (Section 2.1.1) and Fish and Fish Habitat (Section 2.1.2) sections of the Environmental Conditions Report will be updated to reflect the correct information, and will be summarized in the Environmental Impact Assessment Report, under separate cover. ■ The location of provincially rare plants is presented in Figure 2-3 of the Environmental Conditions Report. ■ The Environmental Impact Assessment Report will provide recommendations for targeted species at risk surveys to be undertaken during the Detail Design phase. ■ Clarification that the “not fish habitat” classification is not based solely on the June fish community assessment, but also an assessment of the channel based on the Ministry of Natural Resources and Forestry’s Stream Permanency Handbook (2013). ■ Confirmation that a background information request was submitted to Lake Simcoe Region Conservation Authority on December 4, 2019, and no aquatic data was provided. Requested LSRCA’s aquatic data again to verify existing documentation.

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Utility- TELUS	<ul style="list-style-type: none"> ■ Presence of infrastructure 	<ul style="list-style-type: none"> ■ Confirmation that TELUS has no underground infrastructure within the Study Area. 	<ul style="list-style-type: none"> ■ Acknowledged receipt of this information.
Utility- Telecon	<ul style="list-style-type: none"> ■ Presence of infrastructure 	<ul style="list-style-type: none"> ■ Confirmation Telecon has no plant within 2 metres of proposed work. 	<ul style="list-style-type: none"> ■ Acknowledged receipt of this information.
Organization- Simcoe County District School Board	<ul style="list-style-type: none"> ■ Proximity to school 	<ul style="list-style-type: none"> ■ Requested environmental and engineering studies to review impacts on a newly constructed elementary school. 	<ul style="list-style-type: none"> ■ The Ministry is undertaking 15 environmental studies to update and document existing conditions, identify, and evaluate potential impacts and recommend mitigation measures to address identified impacts and the results will be presented in the next Public Information Centre and documented in the Environmental Impact Assessment Report. ■ Confirmation that the Technically Preferred Route will have no direct impact on the school.
Organization- Rescue Lake Simcoe	<ul style="list-style-type: none"> ■ Timelines 	<ul style="list-style-type: none"> ■ Requested information on the timeline for the publication of the Final Environmental Conditions Report. ■ Requested information on the construction timeline for the County Road 4 Early Works. 	<ul style="list-style-type: none"> ■ Confirmation that the Final Environmental Conditions Report will be published in Fall 2022. ■ Confirmation that Early Works construction will start in 2022.
Organization-Rescue Lake Simcoe	<ul style="list-style-type: none"> ■ Public Information Centre #2 	<ul style="list-style-type: none"> ■ Inquired if Public Information Centre #2 will be online or in person. ■ Inquired about the format of Public Information Centre #2. 	<ul style="list-style-type: none"> ■ Confirmation that details on the location, timing, and format of Public Information Centre #2 will be provided to all stakeholders on the Project Contact List once the date has been scheduled.
Organization- Rescue Lake Simcoe	<ul style="list-style-type: none"> ■ Traffic Study 	<ul style="list-style-type: none"> ■ Requested a link to the Traffic Study. 	<ul style="list-style-type: none"> ■ Confirmation that the Traffic Study is being completed, and relevant information will be incorporated into materials presented at Public Information Centre #2 and documented in the Draft Environmental Impact Assessment Report.
Organization- Rescue Lake Simcoe	<ul style="list-style-type: none"> ■ Alternatives 	<ul style="list-style-type: none"> ■ Requested a comparison of the impacts to natural areas, for each of the alternatives considered in the 1997 Route Planning Study. 	<ul style="list-style-type: none"> ■ Redirected to Section 3.5 of the Route Planning and Environmental Study Report outlining the generation of corridor alternatives for a new roadway and providing an analysis and evaluation between the corridor alternatives.
Organization- Rescue Lake Simcoe	<ul style="list-style-type: none"> ■ Lake Simcoe Protection Plan 	<ul style="list-style-type: none"> ■ Noted the Lake Simcoe Protection Plan was not mandated when an alternative was chosen. 	<ul style="list-style-type: none"> ■ Confirmation that the current Preliminary Design Study is re-assessing impacts that were assessed as part of the 2002 Route Planning Study with respect to the Lake Simcoe Protection Act and Lake Simcoe Protection Plan through the consideration of water quality and quantity, stormwater management, groundwater management, landscaping and ecological restoration measures.

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Organization-Rescue Lake Simcoe	<ul style="list-style-type: none"> Environmental concerns 	<ul style="list-style-type: none"> Concerns with impacts to human health Concerns with impacts to natural environment Climate change impacts 	<ul style="list-style-type: none"> Anticipated potential impacts (positive and negative) on human health, such as air quality, noise, land use, traffic congestion and safety, economic, social cohesion, and neighbourhood resources will be taken into consideration. Strategies may be recommended to mitigate negative impacts and potentially enhance positive outcomes of the project. Relevant information will be documented in the Environmental Impact Assessment Report, under separate cover. Confirmation that the Ministry is conducting a Terrestrial Ecosystem Existing Conditions and Impact Assessment and a Fish and Fish Habitat Existing Conditions and Impact Assessment which will assess the project-specific impacts of the project including existing conditions and identification of mitigation measures to avoid or minimize these impacts. The Qualitative Assessment of climate change impacts related to the Bradford Bypass is anticipated to be conducted in accordance with the Ministry of Environment Conservation and Parks' Climate Change Guide (Considering Climate Change in the Environmental Assessment Process, 2017), and is to consider the project's expected production of GHG emissions and impacts on carbon sinks, as well as the resilience or vulnerability of the undertaking to changing climatic conditions.
Organization- Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> Statement of Qualification and Limitation 	<ul style="list-style-type: none"> Concern with the addition of the Statement of Qualification and Limitations in the AECOM report. 	<ul style="list-style-type: none"> Inclusion of a State of Qualification and Limitations is standard practice for a report of this nature. The constraints and limitations that are applicable are set out in the document.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> Alternative corridors 	<ul style="list-style-type: none"> Request to consider alternative corridor locations Requested the criteria for analysis of alternatives. 	<ul style="list-style-type: none"> Alternative corridor locations are not being considered, and the Preliminary Design phase will include refinements to the Technically Preferred Route. The criteria for assessment and evaluation of the preferred alignment and design will be summarized in the Environmental Impact Assessment Report, and Table 5-1 of the Environmental Conditions Report also provides a summary of refinement evaluation factors and criteria.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> Environmental concerns 	<ul style="list-style-type: none"> Concerns with road salt. Requested salt be added to the list of contamination materials. Clarification on what criteria the Human Health Risk Assessment will be used to assess the impacts. Concerns with vulnerability score of the highly vulnerable aquifers. Concerns with noise impacts. 	<ul style="list-style-type: none"> Confirmation the ministry will assess impacts with respect to the Lake Simcoe Protection Act and the Lake Simcoe Protection Plan through consideration of water quality and quantity, stormwater management, groundwater management, landscaping and ecological restoration measures; as well as fluvial geomorphological designs for watercourses, erosion and sediment control and spills prevention and protection measures. Clarification salt related contaminants for the purpose of keeping the highway safe for traffic conditions, is exempted and not considered a contaminant based on Section 2 of Regulation 339. Anticipated potential impacts (positive and negative) on human health, such as air quality, noise, land use, traffic congestion and safety, economic, social cohesion, and neighbourhood resources will be taken into consideration. Strategies may be

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
			<p>recommended to mitigate negative impacts and potentially enhance positive outcomes of the project. Relevant information will be documented the Environmental Impact Assessment Report, under separate cover.</p> <ul style="list-style-type: none"> ■ Clarification that all highly vulnerable aquifers have a vulnerability score of 6, and which only indicates that water travels from the ground's surface down to the aquifer quickly, and a Groundwater Impact Assessment and Stormwater Management Plan are being completed to mitigate impacts to Highly Vulnerable Aquifers. ■ Confirmation a Noise Impact Assessment is being undertaken for the Preliminary Design in accordance with the Ministry of Transportations Environmental Guide for Noise.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> ■ Indigenous consultation 	<ul style="list-style-type: none"> ■ Concern with consultation efforts with Indigenous communities. 	<ul style="list-style-type: none"> ■ Confirmation that the Project Team is consulting and engaging with Indigenous communities whose Aboriginal and Treaty Rights may be adversely impacted by the project, as well as communities that are interested in the project-specific assessment of environmental impacts.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> ■ Consultation 	<ul style="list-style-type: none"> ■ Request to include comments from Forbid Roads Over Green Spaces Judicial Review on November 2, 2022 in the Final Environmental Conditions Report. ■ Concern with consultation with Fisheries and Oceans Canada. ■ Request to include Forbid Roads Over Green Space's comments from Public Information Centre #1 in the Draft Environmental Conditions Report. 	<ul style="list-style-type: none"> ■ Confirmation if the decision from the Judaical Review is submitted to the Project Team, it will be included as part of the consultation record for the Environmental Impact Assessment Report. ■ Confirmation a meeting was held with Fisheries and Oceans Canada on March 9, 2022 to discuss the Bradford Bypass Project and provide an update on the Early Works, including a discussion on the process of engaging Fisheries and Oceans Canada through further design and construction. ■ Confirmation comments received during Public Information Centre #1 are summarized in Table 4-5 of the Environmental Conditions Report.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> ■ Reports 	<ul style="list-style-type: none"> ■ Request to include links for provincial reports on the Project Website and in the references section of the Environmental Conditions Report. 	<ul style="list-style-type: none"> ■ Provided links to requested provincial reports.
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> ■ Reasoning for highway 	<ul style="list-style-type: none"> ■ No need to build the Bradford Bypass in the proposed Study Area. 	<ul style="list-style-type: none"> ■ Confirmation the reasoning for the selected Study Area is based on various studies that have taken place leading up to the re-initiation of the Bradford Bypass in 2020. Signification population growth is projected for both Simcoe County and the Regional Municipality of York. The Bradford Bypass has been proposed as a response to this dramatic growth in population and travel demand in the area, including the forecasted increase in congestion on key east-west roadways linking Highway 400 to Highway 404. The proposed location for the Bradford Bypass was also identified in A Place to Grow: Growth Plan for the greater Golden Horseshoe (2019).
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> ■ Lack of trust 	<ul style="list-style-type: none"> ■ Mistrust in the Ontario government because of 'misleading' statements related to fish and fish habitat protections. 	<ul style="list-style-type: none"> ■ Confirmation the Ministry will comply with the Federal Fisheries Act and obtain any necessary permits and approvals, and continue to consult with the Department of Fisheries and Oceans Canada and the Ministry of Natural Resources and Forestry regarding impacts and mitigation measures to fish and fish habitat.

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Organization-Forbid Roads Over Green Spaces (FROGS)	<ul style="list-style-type: none"> Holland River Crossings 	<ul style="list-style-type: none"> Suggesting pile requirements for the Holland River Crossings. 	<ul style="list-style-type: none"> Confirmation the design, foundations, and engineering of the structures over the Holland River Crossings are still being determined, and additional details will be provided in the Environmental Impact Assessment Report.
Public	<ul style="list-style-type: none"> Access to Draft Environmental Conditions Report 	<ul style="list-style-type: none"> Requested a link to the Draft Environmental Conditions on the Project Website. Request to have the Draft Environmental Conditions Report mailed to their home. 	<ul style="list-style-type: none"> Confirmation the posting of the Draft Environmental Conditions Report has been delayed and will be made available shortly. Confirmation that the Draft Environmental Report is now available on the Project Website. Confirmation if they are unable to access the Draft Environmental Conditions Report digitally, a hard copy can be mailed out.
Public	<ul style="list-style-type: none"> Updates to contact information 	<ul style="list-style-type: none"> Requested to be removed from the Project Contact List. Request to update email address in the Project Contact List. 	<ul style="list-style-type: none"> Contact information has been removed. Email address has been updated.
Public	<ul style="list-style-type: none"> Support for the Bradford Bypass 	<ul style="list-style-type: none"> General support for the Bradford Bypass Project. 	<ul style="list-style-type: none"> Acknowledgement of support.
Public	<ul style="list-style-type: none"> Bradford Hill Site (BaGv-112) 	<ul style="list-style-type: none"> Concerns with the impacts associated with the design alternatives presented between 10th Sideroad and 2nd Concession Road. Requested clarification on the reasoning for the alternatives presented between 10th Sideroad and County Road 4. Requested further details on the Bradford Hill Site (BaGv-112). 	<ul style="list-style-type: none"> Confirmation that the Ministry is undertaking 15 environmental studies to update and document existing conditions, identify, and evaluate potential impacts and recommend mitigation measures to address identified impacts. Clarified that the alternatives between 10th Sideroad and County Road 4 were chosen due to the identification of an archaeological site (BaGv-112), as part of a Stage 2 Archaeological Assessment completed for the project. Clarification that further details on the Bradford Hill Site (BaGv-112) can not be shared to the public to protect personal privacy and sensitive archaeological sites.
Public	<ul style="list-style-type: none"> Property impacts 	<ul style="list-style-type: none"> Concerns with impacts to individual property. Inquiries about proximity of the Technically Preferred Route to private properties. 	<ul style="list-style-type: none"> Confirmation that the Technically Preferred Route does not directly impact their property. Clarification provided to property owner about proximity of their property to the Technically Preferred Route, and confirmation the Project Team is already arranging meetings with impacted property owners prior to Public Information Centre #2 to understand individual concerns and identify opportunities to mitigate impacts.
Public	<ul style="list-style-type: none"> Traffic 	<ul style="list-style-type: none"> Inquiry about traffic signs. Concerns with traffic impacts caused by detour routes. Concerns with the implementation of stop lights Requested the number of vehicles estimated for the Average Annual Daily Traffic. Requested the percentage of trucks estimated to be apart of the Average Annual Traffic Data 	<ul style="list-style-type: none"> Clarification that Ministry traffic signs are placed along the Technically Preferred Route prior to the completion of construction. Confirmation that a Traffic Study will be completed to assess traffic requirements throughout the project and post-construction. Confirmation traffic lights are only going to be installed at highway ramp terminal intersections, and not on the local road network. Confirmation a Traffic Study is being completed to assess traffic requirements for the project, and key highlights of the study as they pertain to types of vehicles are anticipated to be summarized at Public Information Centre (PIC) #2 anticipated for Fall of 2022, and summarized in the Environmental Impact Assessment Report (EIAR).

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Public	<ul style="list-style-type: none"> Queensville Cemetery 	<ul style="list-style-type: none"> Requested to know the distance between the Queensville Cemetery and the Technically Preferred Route. 	<ul style="list-style-type: none"> Confirmed the distance between the Technically Preferred Route and Queensville Cemetery is 800 metres.
Public	<ul style="list-style-type: none"> Impacts to agriculture 	<ul style="list-style-type: none"> Concerns with impacts to agricultural lands. 	<ul style="list-style-type: none"> Confirmation that the Ministry is undertaking an Agricultural Impact Assessment to update and document existing conditions, identify, and evaluate potential impacts of the project and recommend mitigation measures to reduce potential impacts and meet current environmental legislative requirements.
Public	<ul style="list-style-type: none"> Navigational uses 	<ul style="list-style-type: none"> Provided information on the type of personal vessel used for recreational purposes. 	<ul style="list-style-type: none"> Acknowledgement of information provided, and confirmation that the information will be factored into the design considerations in order to meet the requirements under the Canadian Navigable Water Act and consultation with Transport Canada.
Public	<ul style="list-style-type: none"> Highway 400 alternatives 	<ul style="list-style-type: none"> Highlighted preference for Alternatives 3 and 4 for the Highway 400 refinement alternatives. 	<ul style="list-style-type: none"> Provided link to information materials from Public Information Centre #1 on the Highway 400 alternatives, and acknowledged preference for Alternative 3 and 4 and confirmation that stakeholder comments and concerns are taken into consideration when evaluating the preferred alternatives.
Public	<ul style="list-style-type: none"> Proximity to school 	<ul style="list-style-type: none"> Requested distance between newly constructed elementary school to Technically Preferred Route. 	<ul style="list-style-type: none"> Confirmation that the Technically Preferred Route will not have direct impact on their school. Confirmed the distance between the Technically Preferred Route and the elementary school is approximately 200 metres.
Public	<ul style="list-style-type: none"> Mapping 	<ul style="list-style-type: none"> Requested that the mapping on the Notice of Publication of Draft Environmental Conditions Report be updated. 	<ul style="list-style-type: none"> No further action required. Individual requested to remain anonymous and did not provide an email address to issue the response.
Public	<ul style="list-style-type: none"> Impacts to terrestrial ecosystem 	<ul style="list-style-type: none"> Concerns regarding timing of terrestrial ecosystems field surveys, potential impacts to Blanding's Turtle, and Species at Risk Act status for Species of Conservation Concern. Concern with impacts to Provincially significant Wetlands. Concerns with Species at Risk and Species of Conservation Concern 	<ul style="list-style-type: none"> Confirmation that standard breeding, amphibian call and ecological land classification surveys have been conducted as part of the project. Updates to Species at Risk status in Table 2-8. Confirmation that the Ministry is conducting a Terrestrial Ecosystem Existing Conditions and Impact Assessment studies which will assess the project-specific impacts of the project including existing conditions and identification of mitigation measures to avoid or minimize these impacts.
Public	<ul style="list-style-type: none"> Noise impacts 	<ul style="list-style-type: none"> Concern with the increase in noise levels. 	<ul style="list-style-type: none"> A Noise Impact Assessment is being undertaken for the refined Preliminary Design of the Technically Preferred Route in accordance with the Ministry's Environmental Guide for Noise to investigate noise mitigation measures.
Public	<ul style="list-style-type: none"> Indigenous consultation 	<ul style="list-style-type: none"> Concern with consultation efforts with Indigenous communities. 	<ul style="list-style-type: none"> The Project Team is consulting and engaging with Indigenous communities whose Aboriginal and Treaty Rights may be adversely impacted by the project, as well as communities that are interested in the project-specific assessment of environmental impacts.

Comment Received From	Theme of Feedback	Feedback	Project Team Actions
Public	<ul style="list-style-type: none"> Impacts to human health 	<ul style="list-style-type: none"> Concern with potential impacts to human health. 	<ul style="list-style-type: none"> Anticipated potential impacts (positive and negative) on human health, such as air quality, noise, land use, traffic congestion and safety, economic, social cohesion, and neighbourhood resources will be taken into consideration. Strategies may be recommended to mitigate negative impacts and potentially enhance positive outcomes of the project. Relevant information will be documented the Environmental Impact Assessment Report, under separate cover.
Public	<ul style="list-style-type: none"> Impacts to groundwater 	<ul style="list-style-type: none"> Concern with contamination of groundwater and run-off. 	<ul style="list-style-type: none"> A Drainage and Hydrology Assessment and Groundwater Impact Assessment will be undertaken to develop an efficient and effective drainage system for the freeway, while addressing potential impacts relative to runoff and the change in impervious cover.
Public	<ul style="list-style-type: none"> Concrete barriers 	<ul style="list-style-type: none"> Requested information on whether concrete walls will be implemented. 	<ul style="list-style-type: none"> A Landscape Composition Plan is ongoing and the Recommended Plan will be presented at the Public Information Centre #2 in Fall 2022.
Public	<ul style="list-style-type: none"> Road gradients 	<ul style="list-style-type: none"> Requested road gradient information between Yonge Street and 10th Sideroad. 	<ul style="list-style-type: none"> Details on road surface are being finalized in accordance with Transportation Association of Canada Geometric Standards for Freeway Facilities.

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