Prepared for:
Ministry of Transportation, Ontario
Eastern Region
1355 John Counter Blvd.
Kingston, ON, K7K 0E5

Prepared by:
Stantec Consulting Ltd.
100-300 Hagey Blvd
Waterloo, ON N2L 0A4

Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report

Highway 401 East of Brockville, Planning, Preliminary Design and Class Environmental Assessment Study, GWP 4111-22-00

August 2025

Sign-Off Page

The conclusions in the Report titled Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

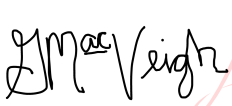
Stantec has assumed all information received from the Ontario Ministry of Transportation (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by  Digitally signed by Brooks, Jordan Date: 2025.09.17 15:07:52 -04'00'

(signature)

Jordan Brooks, B.Sc.
Fisheries Assessment Specialist/ Aquatic Ecologist

Prepared by  Digitally signed by MacVeigh, Gina Date: 2025.09.17 12:39:16 -04'00'

(signature)

Gina MacVeigh, F.W.T.
Fisheries Assessment Specialist/ Senior Fisheries Biologist

Reviewed by Johns, Mike Digitally signed by Johns, Mike Date: 2025.09.17 14:37:42 -04'00'

(signature)

Mike Johns, Tech. Dipl.
Fisheries Assessment Specialist/Senior Aquatic Biologist

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

The Ontario Ministry of Transportation (MTO) has retained Stantec Consulting Ltd. to undertake a Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study on Highway 401 for the replacement and rehabilitation of Sharpe's Lane Bridge and Butlers Creek Culvert and identifying the future Highway 401 footprint for an interim six lanes and ultimate eight lanes. The GWP 4111-22-00 Study Area is from 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road (approximately 2.6 km), in the Township of Elizabethtown-Kitley, east of Brockville, in the United Counties of Leeds and Grenville as shown on the key map (Figure 1).

The project is being completed following the MTO *Class Environmental Assessment (EA) for Provincial Transportation Facilities and Municipal Expressways* (2024) for a Group 'B' undertaking. Group 'B' projects are considered major improvements to existing transport facilities.

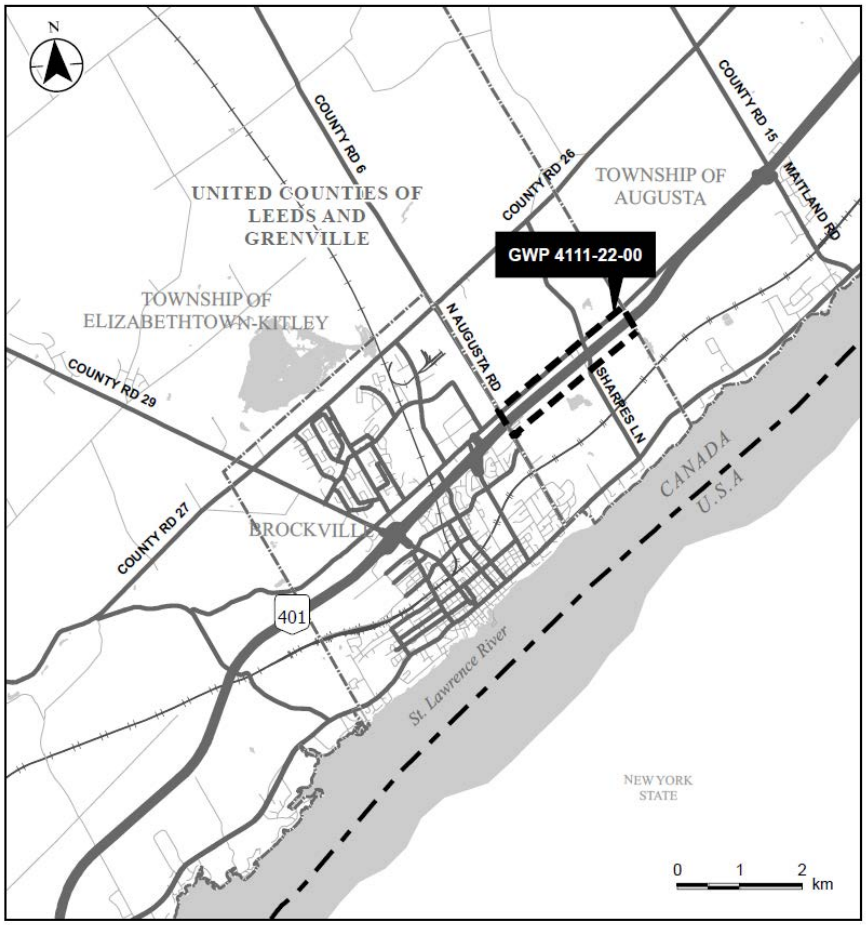
As part of this study, the project team has reviewed existing conditions, developed and evaluated alternatives, identified appropriate improvements, and developed environmental protection and mitigation measures. A Recommended Plan (also referred to as the Preferred Plan) for the Highway 401 study area has been confirmed and designated (in other words, protected for future improvements). This is a long-term planning study and there are no plans to proceed with construction for at least 10 or more years.

This *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report* provides supporting documentation for the replacement and rehabilitation of one overpass bridge and one structural culvert on Highway 401 and the Highway 401 lane expansion component of the study (GWP 4111-22-00). This report documents fish communities and fish habitat associated with surface water features within the MTO right-of-way (ROW). This report also reviews the preliminary potential impacts of the highway project on fish and fish habitat based on the Recommended Plan. A *Fish and Fish Habitat Existing Conditions Report* (Stantec 2024) was previously prepared for this study (GWP 4111-22-00), but this *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report* supersedes the information previously provided.

This report was completed in accordance with the *Environmental Guide for Fisheries (Fish Guide)* (MTO 2025a) and *Fisheries Protocol* (as outlined within the Fish Guide). Field forms from the 2020 *Environmental Guide for Fish and Fish Habitat* (MTO 2020a) were used to collect data in 2024; therefore, both MTO guidance documents are referenced in this report.

Terrestrial environment features for this project are described in a separate report (Stantec 2025a).

Figure 1: Study Area Location



1.1 Location of Work

The first step of the Fisheries Protocol, as outlined within the Fish Guide is to determine whether or not a waterbody is present within the project limits, and if yes, whether the waterbody supports fish and fish habitat (MTO 2025). The purpose of this step is intended as a screening process to determine if work/undertaking/activity will affect fish or fish habitat within a waterbody, as defined below. If the presence of a waterbody cannot be determined using mapping tools, then further review would be required.

Some of the culvert crossings, not associated with mapped watercourses were screened out, as per Step 1 of the Fisheries Protocol, as not having the potential to support fish or fish habitat within the *Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road* (Ainley Group 2016) and the *Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road* (Ainley Group 2017), and as such, were not included within the Location of Works Table or shown on the Figures within this report. Non-rigid frame concrete box (NRFB) and non-rigid frame concrete open-bottom (NRFO) centerline culverts that were discussed in the Preliminary Drainage and Hydrology Report (Stantec 2024b) are included in the Location of Works Table whether they have been previously identified as not having the potential to support fish or fish habitat in the previous reports (Ainley Group 2016, Ainley Group 2017).

An additional culvert (ET_24+260) was identified within the Culvert Condition Report (Ainley Group 2016) as having potential fish habitat within 30 m of the potential proposed activities. A second additional culvert (ET_25+250) was identified within the Culvert Condition Report (Ainley Group 2016) as having potential for fish habitat within 30 m. It has been identified that this additional culvert (ET_25+250) had the incorrect chainage in the Culvert Condition Report and should be ET_25+027 (an NRFO culvert). This has been updated in this report.

Table 1 is the Location of Works (MTO Template D1) and provides the coordinates of the surface water features and culvert crossings within the MTO ROW for GWP 4111-22-00 that were not screened out based on previous work (Ainley Group 2016, Ainley Group 2017). Figure 2, Appendix A: provides a map outlining the project limits and waterbody locations (identified by the MTO chainage). Figure 2, Appendix A: provides a map outlining the project limits and waterbody locations, including the MTO chainage.

Table 1: Location of Work - Highway 401 East of Brockville (GWP 4111-22-00) (MTO Template D1)

Waterbody ID	Culvert / Storm Sewer ID[1]	Highway	MTO Station / Municipality	Latitude (N)	Longitude (W)
No Mapped Feature ET_24+260	2504010043	401	24+260 Elizabethtown	44.617734	-75.675672
Butlers Creek (C1) ET_24+364 & Site 16X-0238/C0 Field Site WC36	n/a	401	24+364 Elizabethtown	44.618386	-75.674432
No Mapped Feature (C2) ET_24+599	2504010024	401	24+599 Elizabethtown	44.620022	-75.672469
No Mapped Feature (C3) ET_25+027	2504010025	401	25+027 Elizabethtown	44.622513	-75.668388
No Mapped Feature (C4) ET_25+946	2504010026	401	25+027 Elizabethtown	44.627858	-75.659550
Unnamed Tributary to St. Lawrence AG_10+050 Field Site WC37	n/a	401	10+050 Augusta	44.631124	-75.653461

[1] Ainley Group 2016 & Ainley Group 2017

2.0 Background Data

2.1 Data Sources

The Study Area is located within the jurisdictions of the Kemptville Kingston District of the Ministry of Natural Resources (MNR), the Cataraqui Region Conservation Authority, and the South Nation Conservation Authority (Appendix A:, Figure 2).

A Notice of Study Commencement (NOSC) was sent to the MNR and the Ministry of the Environment, Conservation and Parks (MECP) on May 1, 2024. An application for a Licence to Collect Fish for Scientific Purposes was submitted to the MNR on March 28, 2024 for the spring and summer 2024 fish sampling program. A formal information request was sent to MNR on June 13, 2024, for both GWP's and a response was received on June 18, 2024 (Appendix B:).

Information was also obtained from the following sources:

- Government of Ontario's Geospatial Ontario Database Layers (GEO no date (n.d.)):
- MNR's Land Information Ontario data – to identify mapped watercourses and, where available, the associated flow regime, thermal regime, and fish community data as per the Aquatic Resource Area layer
- Natural Heritage Information Centre (NHIC) database– to determine if provincially regulated fish or freshwater mussel Species at Risk (SAR) have been documented in the Study Area.
- MNR's Fish ON-Line database - to identify fish community data.
- Ontario Ministry of Agriculture, Food and Rural Affairs Constructed Drain database - to identify the presence of mapped constructed drains and, if applicable, the corresponding Drain Class assigned by Fisheries and Oceans Canada (DFO) (DFO 2014).
- DFO's mapping of aquatic SAR (DFO 2025) – to determine if federally regulated fish or freshwater mussel SAR have been documented in the Study Area.
- Aerial images (Google Earth 2025) – to supplement digital map layers of watercourses.

- Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2016)
- Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2017),

2.2 Results

Details obtained from the data sources in Section 2.1 were utilized to compile existing conditions and are summarized below and in the existing conditions section (MTO Template D2A – Existing Fish Habitat Conditions and MTO Template D2B Fish Community Tables) of the report. Within the Study Area, there are two mapped watercourses that cross Highway 401 (MNR 2024a) (Figure 1, Appendix A:).

The Kemptville Kingston District MNR provided the in-water work timing window for the Study Area and thermal regimes of the two mapped watercourses and additionally confirmed that the data retrieved by Stantec from the GEO database was accurate (MNR 2024).

MNR identified that the Fisheries Management Objectives for the watercourses that provide fish habitat is forage/bait fish production and (Traditional and Non-Traditional) sport fish reproduction (MNR 2024). The thermal regime for watercourses were identified to be warm-cool and the timing window for all watercourses that provide fish habitat was identified to be July 1 to March 14 (no in-water work from March 15 to June 30) (MNR 2024).

There are no records of provincially or federally regulated aquatic species in watercourses within the Study Area (DFO 2025; GEO n.d.).

Mapped Watercourses:

Station ET_24+364 / C1 – Butlers Creek (Site 16X-0238/C0)

Butlers Creek crosses Highway 401 approximately 1.2 km northeast of North Augusta Road (Figure 2, Appendix A:). The creek has a permanent flow regime and a warm/cool thermal regime (GEO n.d). Under the Highway, Butlers Creek is conveyed through a 3.6 m (span) X 1.5 m (rise) X 50 m length NRFB culvert.

No fish community data are available for Butlers Creek (GEO n.d; MNR 2024).

Station AG_10+050 / C5 - Unnamed Tributary to St. Lawrence River

The Unnamed Tributary to St. Lawrence River crosses Highway 401 approximately 870 m northeast of Sharpes Line (Figure 2, Appendix A:). The creek has a permanent flow regime and a warm/cool thermal regime (GEO n.d, MNR 2024). Under the Highway, this Unnamed Tributary is conveyed through a 1.8 m (span) X 1.2 m (rise) X 51.8 m length NRFB culvert.

No fish community data are available for the Unnamed Tributary to St. Lawrence River (MNR 2024a; MNR 2024d).

No Mapped Features (box culverts present):

Station ET_24+260

This culvert crosses Highway 401 approximately 1.1 km northeast of North Augusta Road (Figure 2, Appendix A:). This culvert does not have a mapped feature associated with it. No fish community, thermal regime, or flow regime information was available for this location (GEO n.d.). Under the Highway at this location, drainage is conveyed through a 450 mm X 32 m length corrugated steel pipe (CSP) culvert.

The Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2017) report identifies this culvert as only conveying roadside runoff and that this location is not considered to be fish habitat, and no fish habitat features were observed within 30 m of the culvert. The Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2016) identified this location as not providing fish habitat but having the potential to support fish habitat within 30 m, as there is a wetland to the south of the culvert.

Station ET_24+599 / C2

This culvert crosses Highway 401 approximately 1.4 km northeast of North Augusta Road (Figure 2, Appendix A:). This culvert does not have a mapped feature associated with it. No fish community, thermal regime, or flow regime information was available for this location (GEO n.d.). Under the Highway at this location, drainage is conveyed through a 1.2 m (span) X 1.2 m (rise) X 42.3 m length NRFO culvert.

The Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2017) report identifies this culvert as only conveying roadside runoff and that this location is not considered to be fish habitat, and no fish habitat features were observed within 30 m of the culvert. The Final Culvert Condition Report – Highway 401 from

Mallorytown Road to Maitland Road (Ainley Group 2016) identified this location as not providing fish habitat.

Station ET_25+027 / C3

This culvert crosses Highway 401 approximately 1.85 km northeast of North Augusta Road (Figure 2, Appendix A:). This culvert does not have a mapped feature associated with it. No fish community, thermal regime, or flow regime information was available for this location (GEO n.d.). Under the Highway at this location, drainage is conveyed through a 1.2 m (span) X 1.2 m (rise) X 47.6 m length NRFO culvert.

The Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2017) report identifies this culvert as only conveying roadside runoff and that this location is not considered to be fish habitat, and no fish habitat features were observed within 30 m of the culvert. The Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2016) identified this location as not providing fish habitat but having the potential to support fish habitat within 30 m, as there is a wetland to the south of the culvert.

Station ET_25+946 / C4

This culvert crosses Highway 401 approximately 300 m northeast of Sharpes Line (Figure 2**,** Appendix A:). This culvert does not have a mapped feature associated with it. No fish community, thermal regime, or flow regime information was available for this location (GEO n.d.). Under the Highway at this location, drainage is conveyed through a 1.2 m (span) X 1.2 m (rise) X 43.7 m length NRFO culvert.

The Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2017) report identifies this culvert as only conveying roadside runoff and that this location is not considered to be fish habitat, and no fish habitat features were observed within 30 m of the culvert. The Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road (Ainley Group 2016) identified this location as not providing fish habitat.

3.0 Field Investigation

The purpose of the field investigations was to document the aquatic ecological conditions of the watercourses within the Study Area at Highway 401. Additionally, the investigations aimed to confirm the presence of a waterbody and confirm whether fish and fish habitat were present, as per Step 1 of the Fisheries Protocol. Fish habitat characterization and fish community sampling were conducted as described below.

The field investigations were conducted by a crew of two aquatic biologists, overseen by a RAQS-approved Fisheries Assessment Specialist at the mapped watercourses.

3.1 Habitat Assessment

On April 30 and July 11, 2024, MTO Watercourse Field Record Forms and MTO Fish Habitat Mapping Forms were completed for the mapped watercourses within the Study Area (Figure 2, Appendix A:). Forms and documentation were completed following the *Interim Environmental Guide for Fisheries* (MTO 2020).

In situ water quality parameters (dissolved oxygen, conductivity, pH, and temperature) were measured using a multi-parameter water quality meter.

Review of the Terrestrial Ecosystems Existing Conditions report (Stantec 2024a) was also conducted to determine if wetlands were present within 30 m of culvert crossing locations (where it had previously been identified as potentially present).

3.2 Fisheries Inventory

Fish collections were conducted at the mapped watercourses on April 30 and July 11, 2024 using a backpack electrofisher where water was present at the time of the field investigations.

Fish collections were conducted on one side of Highway 401, selected based on habitat conditions. All fish captured were identified and live-released in the field at the site of capture. MTO Fish Community Inventory Records were completed at each location where fish sampling was conducted.

4.0 Fish and Fish Habitat Existing Conditions

Field notes and photographs from Stantec's field investigations are provided in Appendix C and Appendix D, respectively. Existing conditions are illustrated in Figure 3 (Appendix A:).

Stations ET_24+260, ET_24+599, ET_25+027, and ET_25+946 were either not found or not visited because there was existing information available, and as such, photographs from the *Final Culvert Condition Report – Highway 401 from Mallorytown Road to Maitland Road* (Ainley Group 2016) were used to document the fish and fish habitat existing conditions. The photographs in Appendix D include images from the Ainley Group Culvert Inspection (2016) recorded during culvert inspections conducted in September 2015.

A tabulated summary of existing fish habitat conditions (MTO Template D2A) in the Study Area is provided in Table 2, and the summary of existing fish community data (MTO Template D2B) for the Study Area is provided in Table 3. Both tables summarize data collected during Stantec's field investigations, available background data, and information received during MNR consultation. Background information has been compiled for stations not found or visited during field investigations.

Stations or culverts that were screened out as per Step 1 of the Fisheries Protocol minus the previously identified NRFB and NRFO (Ainley Group 2016, Ainley Group 2017, MTO 2020b, MTO 2025a) have not been included in Table A1 and Table A2, Appendix B:, or shown on Figure 2 or Figure 3, Appendix A.

In situ water quality parameters recorded during Stantec's field investigations are provided in Table 4.

As summarized in Table 2 and illustrated in Figure 3 (Appendix A:), the following locations provide direct fish habitat in the Study Area:

- Butlers Creek (Site 16X-0238/C0); Station ET_24+364 / C1
- Unnamed Tributary to St. Lawrence River; Station AG_10+050 / C5

Based on the assessment results, the features that connect some of the sites listed above also support seasonal fish habitat:

- Ditch southwest of Unnamed Tributary to St. Lawrence River on Highway 401 Eastbound side for approximately 50 m

The following locations do not provide fish habitat at the culvert crossing or within 30 m:

- No mapped feature; Station ET_24+260
- No mapped feature; Station ET_25+027 / C3
- No mapped feature; Station ET_24+599 / C2
- No mapped feature; Station ET_25+946 / C4

Table 2: Fish Habitat Existing Conditions - Highway 401 East of Brockville (GWP 4111-22-00) (MTO Template D2a)

Waterbody Name / Waterbody ID	Stantec Field Date(s)	Flow Regime (MNR 2024b; Ainley Group 2016; Ainley Group 2017)	Thermal Regime (GEO n.d.)	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[1]
No mapped feature ET_24+260	Did not locate	MNR: No data Ainley Group: No flow during the culvert inspection. Conveys roadside runoff only.	MNR: No data	No fish habitat at culvert and no fish habitat features were observed within 30 m of the culvert location	N/A	N/A	N/A	N/A	No – Not fish habitat
Butlers Creek (C1) Site 16X-039/C0 ET_24+364 Field Site WC36	2024/04/30 2024/07/11	MNR: Permanent Stantec: Permanent	MNR: Warm/cool	Direct	Clay, cobble, boulder, gravel, sand	April 2024: Eastbound Lane (EBL) (downstream) – Run and pool morphology Average width: 1.5 m (run) – 3 m (pool) Average depth: 0.2 m (run) – 0.3 m (pool) Westbound Lane (WBL) (upstream) – Run morphology Average width: 2 m Average depth: 0.2 m July 2024: EBL (downstream) – Run and pool morphology; at bankfull due to heavy rain Average width: 3 m (run) – 5 m (pool) Average depth: 0.4 m (run) – 0.5 m (pool) WBL (upstream) – Run morphology, fast flow due to heavy rain Average width: 2.4 m Average depth: 0.4 m	Instream: Curly-leaf Pondweed (*Potamogeton crispus*), Filamentous Green Algae (*Cladophora* spp.), Canada Waterweed (*Elodea canadensis*) Riparian: Grasses	Riparian enhancements (i.e., shading)	No

Waterbody Name / Waterbody ID	Stantec Field Date(s)	Flow Regime (MNR 2024b; Ainley Group 2016; Ainley Group 2017)	Thermal Regime (GEO n.d.)	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[1]
No Mapped Feature (C2) ET_24+599	Did not investigate as existing information available.	MNR: No data Ainley Group: Culvert conveys roadside runoff only.	MNR: No data	No fish habitat at culvert and no fish habitat features were observed within 30 m of the culvert location	N/A	N/A	N/A	N/A	No – Not fish habitat
No mapped feature (C3) ET_25+027	Did not investigate as existing information available.	MNR: No data Ainley Group: Culvert conveys roadside runoff only.	MNR: No data	No fish habitat at culvert and no fish habitat features were observed within 30 m of the culvert location	N/A	N/A	N/A	N/A	No – Not fish habitat
No Mapped Feature (C4) ET_25+946	Did not investigate as existing information available.	MNR: No data Ainley Group: Culvert conveys roadside runoff only.	MNR: No data	No fish habitat at culvert and no fish habitat features were observed within 30 m of the culvert location	N/A	N/A	N/A	N/A	No – Not fish habitat

Waterbody Name / Waterbody ID	Stantec Field Date(s)	Flow Regime (MNR 2024b; Ainley Group 2016; Ainley Group 2017)	Thermal Regime (GEO n.d.)	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[1]
Unnamed Tributary to St. Lawrence (C5) AG_10+050 Field Site WC37	2024/04/30 2024/07/11	MNR: Permanent Stantec: Permanent	MNR: Warm/cool	Direct	Silt, muck, clay, gravel	April 2024: EBL (downstream) – Flat, early-stage beaver dam Average width: 15 m Average depth: 0.6 m WBL (upstream) – Run, flat, eroded bank, beaver lodge Average width: 8 m Average depth: 0.5 m July 2024: EBL (downstream) – Pooled impoundment due to beaver dam Average width: 8 m Average depth: 0.7 m WBL (upstream) – Flooded forest extending beyond ROW due to heavy rain and downstream beaver dam. Unable to accurately assess morphology	Instream: Watercress (*Nasturtium officinale*), Slender Naiad (*Najas flexilis*), Narrow-Leaved Cattail (*Typha angustifolia*), Riparian: Grasses, Deciduous Swamp	Large beaver dam EBL (downstream) has created impoundment on both sides of 401. Water levels above culvert openings on both sides during July assessment	No

[1] Significant Fish Habitat as defined in the Fish Guide (MTO 2025a).

Table 3: Fish Community Existing Conditions - Highway 401 East of Brockville (GWP 4111-22-00) (MTO Template D2b)

Waterbody Name / Waterbody ID	Stantec Field Date(s) (yyyy/mm/dd)	Fish Species Present (MNRF 2024a, Stantec 2024)	Year Class	Species at Risk (SAR) Present	In-water Works Timing Window
Butlers Creek (C1) Site 16X-03 9/C0 ET_24+364 Field Site WC36	2024/04/30 2024/07/11	MNR: No data. Stantec 2024: Brook Stickleback (*Culaea inconstans*), Central Mudminnow (*Umbra limi*), Brown Bullhead (*Ameiurus nebulosus*) Johnny/Tessellated Darter (*Etheostoma* sp.), Creek Chub (*Semotilus atromaculatus*)	Adult	DFO 2024; MNR 2024b – No records of federally or provincially regulated aquatic SAR	July 1 to March 14 (No In-Water Work from March 15 to June 30)
Unnamed Tributary to St. Lawrence AG_10+050 Field Site WC37	2024/04/30 2024/07/11	MNR: No data. Stantec 2024: Brook Stickleback, Central Mudminnow	Adult	DFO 2024; MNR 2024b – No records of federally or provincially regulated aquatic SAR	July 1 to March 14 (No In-Water Work from March 15 to June 30)

Notes:
Stations ET_24+260 and ET_25+027 do not provide fish habitat at or within 30 m of the crossing
Stations that do not provide fish and fish habitat have not been included within Table 3.

Table 4: Summary of *in situ* Water Quality Parameters at Culvert Locations that Support Fish Habitat - Highway 401 East of Brockville (GWP 4111-22-00)

Stantec Culvert ID* / MTO Site / Waterbody Name (See Figure 2)	Date (yyyy/mm/dd)	Air Temperature (°C)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH
Butlers Creek ET_24+364 (Eastbound Lanes) Field Site WC36	2024/04/30	10	11.3	7.9	593	8.07
Butlers Creek ET_24+364 (Eastbound Lanes) Field Site WC36	2024/07/11	20	19.6	6.37	467	7.56
Unnamed Tributary to St. Lawrence AG_10+050 (Eastbound Lanes) Field Site WC37	2024/04/30	10	10.9	5.5	620	7.85
Unnamed Tributary to St. Lawrence (C5) AG_10+050 (Eastbound Lanes) Field Site WC37	2024/07/11	20	19.5	6.46	481	7.57

5.0 Constraints and Opportunities

The constraints and opportunities are provided on the Existing Conditions figures (Figure 3**,** Appendix B:**).** These figures show the physical and biological constraints on fish and fish habitat in relation to the highway project. The mapping includes information based on background review and field investigations, on the following:

- Significant fish habitat
- Flow
- Barriers to fish
- Thermal regime
- Fish habitat type (i.e., not fish habitat, direct, or indirect)
- Environmentally sensitive areas
- Special habitat features that present a constraint or allow for an opportunity to be considered in the design.

Species lists from background data sources and Stantec's field investigations indicate that the warm/cool water fish communities in the Study Area are comprised primarily of baitfish species. There are no records of aquatic SAR in watercourses within the Study Area (GEO n.d.; DFO 2025).

At sites where fish habitat (direct or indirect) was identified, the in-water timing window that is applicable is July 1 to March 14 (no in-water work from March 15 to June 30).

Stantec determined that watercourses in the Study Area do not provide Significant Habitat for fish. Significant Habitat means habitat that meets one or more of the following criteria (MTO 2025a):

- *Rare or uncommonly found habitat that may (but may not) be one of the limiting factors to the fish population*
- *Specialized habitat that fish populations are highly dependent on to support critical life functions*
- *Areas contributing to fisheries productivity that are exceptionally productive, likely to be limiting, and are rare or relatively uncommon.*

Opportunities for habitat enhancement are identified at both stations with direct fish habitat within the Study Area.

- Butlers Creek (Site 16X-0238/C0), specifically on the Highway 401 Westbound side, would benefit from enhancements to the riparian zone, such as planting shrub vegetation, in order to increase shading.
- The Unnamed Tributary to St. Lawrence River (AG_10+050 / C5) features a large beaver dam at the Highway 401 Eastbound ROW edge that has caused the impoundment of water on both sides of Highway 401. The Tributary would benefit from having this removed, allowing for better fish passage and less potential for erosion should the beaver dam fail.
    - This feature is located outside of the Project Limits but present within the Study Area.

6.0 Preliminary Impact Assessment

6.1 Description of Work

Based on the Recommended Plan / Preferred Plan for the Study Area (Appendix E), the proposed improvements within the Study Area (GWP 4111-22-00) will involve the following:

- Replacement of the existing Sharpe’s Lane bridge over Highway 401
- Replacement of the existing Butlers Creek culvert
- Widening of Highway 401 to an interim 6-lane and ultimate 8-lane cross-section
- Drainage improvements
- Replacement of existing noise barrier wall along Highway 401

6.2 Potential Impacts to Fish and Fish Habitat

The widening of Highway 401 to an interim 6-lane and ultimate 8-lane cross-section, replacement of the existing Butlers Creek culvert, and drainage improvements, have the potential to affect fish and fish habitat. General work activities and grading may also result in works within 30 m of fish and fish habitat. Figure 4, Appendix A: depicts the Preferred Plan, overlayed with the Fisheries Existing Conditions.

At watercourses identified as fish habitat or having fish habitat potentially present within 30 m (outside of the current ROW), the following works are anticipated to have potential to affect fish and fish habitat:

Butlers Creek (C1, Site 16X-0238/C0)

To accommodate an interim 6-lane and ultimate 8-lane configuration, the Butlers Creek culvert Preferred Plan includes replacing the culvert in a new location east of the existing.

- Removal and replacement of existing 3.6 m span X 1.5 m rise X 50 m length NRFB
- Replacement culvert to be a 4.2 m span by 4.2 m rise. Type of culvert and length to be determined through Detail Design
- Minor realignment of Butlers Creek on both upstream and downstream side of Highway 401
- Works will result in minor property impacts and substantial excavation

Unnamed Tributary to St. Lawrence River (C5, AG_10+050)

- Culvert is outside the Project Limits as per the Preferred Plan but works may occur within 30 m of this feature or require the beaver dam to be removed

A description of the potential proposed works based on the available Preferred Plan information used to complete this preliminary assessment of potential impacts is provided in Table 5.

Table 5: Proposed Work Based on the Recommended Plan at Locations that Support Fish Habitat - Highway 401 East of Brockville (GWP 4111-22-00)

Waterbody Name/ Waterbody ID	Existing Conditions - Type	Existing Conditions - Size (mm)	Existing Conditions - Length (m)	Details of Proposed Conditions / Activities	Assessment - Table 2 Routine MTO Works?	Assessment - Applicable BMP?	Assessment - Fisheries Assessment Required?	Impact Assessment Rationale/Next Steps
Butlers Creek (C1) Site 16X-03 9/C0 ET_24+364 Field Site WC36	NRFB	3600 X 1500	50	To facilitate the highway widening the existing culvert on Butlers Creek will be removed and replaced: Proposed Conditions: New 4200 mm X 4200 mm box culvert (length and type to be determined). Extension length to be determined at Detail Design to accommodate ultimate 8-lane cross-section. New culvert to be located east of the existing culvert, resulting in minor realignment works being needed for Butlers Creek on both ends of the culvert. New highway drainage is likely to be required within highway widening.	No	No	Yes	Conduct a Fisheries Assessment during detail design including an aquatic effects assessment to address removal of existing culvert and replacement with new culvert to the east. The removal of the existing culvert will result in the permanent removal / infilling of approximately 270 m^2 of direct fish habitat. Additional permanent removal of fish habitat to be calculated once re-alignment details are designed. Alteration of fish habitat is also anticipated at the tie-in locations of new aligned channel to existing channel at the upstream and downstream extents. Area for alteration to be calculated once re-alignment details are designed. New habitat below the 2-year high water level will also need to be calculated based on re-aligned area and new culvert dimensions once details are determined. Design and construct replacement channel using natural channel design principles and to avoid the death of fish and the harmful alteration, disruption or destruction of fish habitat. Design culvert to allow for fish passage. DFO review required for channel realignment and new culvert.

Waterbody Name/ Waterbody ID	Existing Conditions - Type	Existing Conditions - Size (mm)	Existing Conditions - Length (m)	Details of Proposed Conditions / Activities	Assessment - Table 2 Routine MTO Works?	Assessment - Applicable BMP?	Assessment - Fisheries Assessment Required?	Impact Assessment Rationale/Next Steps
Unnamed Tributary to St. Lawrence (C5) AG_10+050 Field Site WC37	NRFB	1800 X 1200	51.8	This culvert and watercourse are located outside the Project Limits but as a large beaver dam has impounded water at the site and along the ditches, removal may be required to facilitate project activities.	No	Yes	To be determined	Determine proximity of work to watercourse. If beaver dam needs to be removed, BMP for Beaver Dam Removal may be applicable.

* NFRB = Non-Rigid Frame Box (concrete with concrete floor)

6.3 Applicability of MTO Best Management Practices and Routine Works

MTO has developed the *Environmental Guide for Fisheries - Best Management Practices Manual for Fisheries* (Version 4*)* (MTO 2025b) and *Environmental Guide for Fisheries – Maintenance Works* (Version 4*)* (MTO 2025c). The Best Management Practices (BMPs) and Maintenance (Routine) Works were developed for routine activities in or near water to reduce potential impacts to fish and fish habitat.

If a project is located within 30 m of the high-water level of a waterbody and the activity is listed in Routine MTO Works Table 2 of the Fisheries Protocol, it can proceed without a fisheries assessment (Step 1 of the Fisheries Protocol). Mitigation measures must be implemented to reduce the risk of the death of fish and the harmful alteration, disruption or destruction (HADD) of fish habitat.

The BMPs streamline the regulatory review process for routine highway activities and provide mitigation measures to reduce the risk of the death of fish and HADD of fish habitat. A project can proceed without DFO review if the conditions and mitigation measures outlined in a BMP can be met (Step 3 of the Fisheries Protocol). Where a BMP is used, an MTO Project Notification Form is completed and filed by MTO (Step 5).

If a project cannot meet the conditions of a BMP at Step 3 of the Fisheries Protocol, a fisheries assessment is conducted to determine the likelihood of the HADD of fish habitat (Step 4). Projects proceed to Step 5 (MTO Project Notification) when there are no federally listed SAR, and it is determined that HADD of fish habitat is not likely. Where HADD is likely and/or where federally listed SAR are present, the project proceeds to Step 6 of the Fisheries Protocol where a Request for Review Application Form is submitted to DFO for review under the *Fisheries Act*.

The applicability of Table 2 of the Fisheries Protocol should be determined during the Detail Design phase of the project for work that occurs within 30 m of fish habitat. Where activities in Table 2 of the Fisheries Protocol do not apply, the applicability of BMPs should be determined for work in or within 30 m of water crossings where fish habitat was identified in the Study Area. Based on the Preliminary Design information summarized herein, and illustrated in the Recommended Plan (Appendix E), the following BMP should be considered at Step 3 of the Fisheries Protocol during Detail Design:

- **Beaver Dam Removal** – although no works are anticipated (based on the preferred plan) at the Unnamed Tributary to St. Lawrence River (AG_10+050 / C5) as it is

outside of the project limits, a large beaver dam was identified at the Highway 401 Eastbound ROW edge that has caused impoundment of water on both sides of the Highway. If during detail design it is identified that the beaver dam is impacting the project works, this BMP should be considered.

- **Ditch Maintenance within 30 m of a Waterbody** – the nature and extent of ditch maintenance is not known and should be assessed during Detail Design.

To be in compliance with the *Fisheries Act* and the Fisheries Protocol, the design and construction of work in or near fish habitat must be undertaken in accordance with operational conditions, constraints, and the protection measures provided in the BMPs.

6.4 Preliminary Fisheries Assessment

Proposed changes to culverts and other work that has the potential to affect fish and fish habitat are summarized in Table 6**.**

Based on data available at the time of report preparation, there are no aquatic SAR in the Study Area (DFO 2025; GEO n.d.); however, the databases and SAR statuses are updated from time to time and should be consulted again during Detail Design.

At Butlers Creek (Site 16X-039/C0) the existing culvert and watercourse within the Project Limits supports fish and fish habitat. The spatial extent of fish habitat directly affected by the project, through the removal and replacement of the culvert, minor realignment of the watercourse, and widening of the highway will need to be determined and/or confirmed once the following information is confirmed:

- New culvert length (and confirmation of dimension and structure type)
- The need for rock protection in the creek bed (areal extent, aggregate size)
- The extent of the channel realignment and the channel realignment details
- Details of other activities that may affect fish and fish habitat

Rock protection (waterbody material) is often added to the bed and/or banks of watercourses at both ends of culverts where extensions and new culverts are proposed. The intent of the rock protection is to reduce the risk of scour and erosion of the bed and banks of watercourses. The area of rock protection should be determined using the *Drainage Management Manual* (MTO 1997). The extent (area) of rock protection to be added and the area that will directly affect fish habitat should be determined during Detail Design and documented in a fisheries assessment.

If rock protection (waterbody material) is proposed within the bankfull channel, the extent (area) of rock protection to be added and the area that will directly affect fish habitat should be determined during Detail Design and documented in the aquatic effects assessment. The rock protection (waterbody material) particle size should be determined using expected water velocities and selected from Table 3 or Table 4 of Ontario Provincial Standard Specification (OPSS) 1005. The addition of Granular B to the waterbody material should be considered to maintain wetted habitat by reducing water loss among the interstitial spaces in the rock protection.

As a minor realignment is necessary with the installation of the new culvert, fish passage needs to be considered. A low flow channel should be considered and constructed to facilitate fish passage. Details of a low flow channel or how fish passage will be maintained should be determined during Detail Desing and documented in the aquatic effects assessment.

As part of the fisheries assessments during Detail Design, Pathways of Effects (POEs) for land-based and in-water activities will need to be applied to determine the likelihood of the death of fish and/or HADD of fish habitat.

The following list provides potential effects of the proposed work that may occur at or within 30 m of Butlers Creek that provides fish habitat:

Culvert Removal

- Loss of habitat due to infilling of fish habitat.

  - Removal of Butlers Creek culvert has a footprint of approximately 270 m^2 of direct fish habitat. Additional permanent removal of fish habitat will also need to be calculated once realignment details are designed.

- Removal of riparian vegetation and cover along the banks or shoreline of a waterbody

- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)

- Creation of barriers to fish movement (e.g., perched crossings, velocity barriers, alteration of the natural stream gradient, restrictive causeways resulting in the loss of floodplain which may be used by fish for passage during high flows)

- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies

- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation
- Death of fish

New Culvert Installation

- Loss of habitat
- Anticipated as culvert will be longer to accommodate the highway widening
- Changes to (or loss of) habitat for channel realignment
- Infilling floodplain fish habitat with temporary construction access ramps
- Removal of riparian vegetation and cover along the banks of a waterbody
- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Creation of barriers to fish movement (e.g., perched crossings, velocity barriers, alteration of the natural stream gradient)
- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies
- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation
- Death of fish

Channel Realignment/Channel Relocation

- Changes to and/or loss of habitat
- Infilling floodplain fish habitat with temporary construction access ramps
- Removal of riparian vegetation and cover along the banks of a waterbody
- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Creation of barriers to fish movement (e.g., velocity barriers, alteration of the natural stream gradient)

- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies
- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation
- Death of fish

Ditch Maintenance

- Removal of habitat features from ditch, adjacent banks and riparian zone (resulting in loss and/or reduction in diversity of habitat)
- Removal or disruption of migratory corridor (barrier to fish migration)
- Sedimentation of spawning, rearing and food production areas
- Reduction in food supply
- Reduction or disruption of invertebrate production
- Reduced water quality (increased turbidity, sedimentation, warming of water)
- Changes to flow regime (especially base flows)
- Drainage works may negatively impact adjacent wetlands by lowering the water table
- Introduction of deleterious substances
- Loss of riparian vegetation
- Disturbance to the banks and the bottoms of ditches from the use of heavy equipment
- Decreased channel/bank stability to the receiving waterbody.

6.5 Preliminary Avoidance and Design Considerations

As indicated through the previous sections, there is potential for impacts to fish habitat within the Study Area. Avoidance of impacts was initially implemented through the alternatives analysis process. Further avoidance of potential impacts may be feasible during Detail Design through reducing the potential footprints below the high-water mark where the culvert removal and replacement and realignment are proposed.

The following measures should be considered during Detail Design to further reduce the risk of impacts to fish and fish habitat:

- Design the channel relocation/ realignment using natural channel design principles such that it continues to provide fish habitat and fish passage
- New box culvert should consider open foot design, or if not feasible be embedded to allow for fish passage
- Design drainage system to reduce changes in drainage to watercourses that provide fish habitat
- Design and plan activities and works to reduce loss of fish habitat and disturbance to fish habitat
- Design stormwater management measures to reduce effects on watercourses that provide fish habitat
- Design a rehabilitation/re-vegetation plan for long-term stability of the areas disturbed during construction
- For rock reinforcement below the normal high-water level, use appropriately sized material and install at a similar slope to the existing, maintain a uniform bank/shoreline and maintain a natural bank/shoreline alignment such that it does not interfere with fish passage or alter the bankfull channel profile.

Design considerations with respect to fish and fish habitat in the Study Area are provided in Table 6. This table is to be referred to and updated through Detail Design to describe how each factor was addressed.

Table 6: Design Considerations - Highway 401 from Mallorytown to Brockville (GWP 4011-22-00)

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
In-water Works Timing Window	At sites where fish habitat (direct or indirect) was identified, the following in-water timing windows is applicable: Schedule work to occur from July 1 to March 14 (no in-water work from March 15 to June 30).	To be determined as the project progresses through design
Fish Passage	Design new culvert crossings to allow for fish passage. Fish passage should be designed for Butlers Creek (Site 16X-0238/C0). Design channel realignment to allow for fish passage.	To be determined as the project progresses through design
Significant Fish Habitat	No Significant Fish Habitat present.	To be determined as the project progresses through design
Constraints and Opportunities	Opportunities for habitat enhancement are identified at both sites. • Butlers Creek (Site 16X-0238/C0), specifically on the Highway 401 Westbound side, would benefit from enhancements to the riparian zone, such as planting shrub vegetation, in order to increase shading. • The Unnamed Tributary to St. Lawrence River (AG_10+050 / C5) features a large beaver dam at the Highway 401 Eastbound ROW edge that has caused the impoundment of water on both sides of Highway 401. During the July 11, 2024 survey water levels exceeded the top of the culvert openings on both sides of Highway 401.	To be determined as the project progresses through design

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
Other Considerations	None	None

6.6 Mitigation Measures

Given the low sensitivity of direct fish habitat identified within the Study Area, it is anticipated that standard provincial and MTO specifications can be used to reduce the potential impacts from construction activities to reduce the potential for a HADD.

For most of the in-water works, protection of fish and fish habitat is expected to be achieved through implementation of the prescribed in-water timing window and the measures outlined within the Ontario Provincial Standard Specifications (OPSS) and MTO Standard Special Provisions (SSP).

New culvert installation at Butlers Creek should adhere to MTO design standards as they relate to fish passage at culverts identified to support direct fish habitat.

Mitigation of impacts to fish habitat from sources such as erosion and sedimentation that can occur during construction activities including, but not limited to, staging, vegetation clearing, dewatering and stockpiling, can be achieved through implementation and adherence to standard measures outlined within OPSS. Additional measures outlined within MTO SSP are also anticipated to be applicable to the project during the Detail Design in order to further mitigate potential impacts to fish and fish habitat.

Further construction measures and the OPSS and MTO SSP that are likely applicable to this project are provided in Section 6.6.2.

6.6.1 Timing

The in-water construction window for watercourses in the Study Area where fish habitat was identified is July 16 to March 14 inclusive (i.e., in-water work is not permitted from March 15 to July 15) (MNR 2024d). This timing window does not apply to work above the high-water level.

Additional timing considerations are as follows:

- Reduce the duration of in-water work
- Conduct in-water work during periods of low flow to allow work in water to be isolated from flows
- Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation

- Allow time for re-stabilization and re-vegetation as appropriate prior to winter

6.6.2 General

The following general measures are applicable to the project and should be designed and implemented following the OPSSs listed below:

- Limit access to banks or areas adjacent to watercourses to the extent required for construction activities
- Manage and treat dewatering (or other) discharge water to reduce the risk of erosion and/or release of sediment-laden or contaminated water to surface water features
- Operate machinery on land above the high-water level
- Operate, store, and maintain (e.g., refuel) equipment, vehicles, and materials in a manner that reduces the risk of the entry of deleterious substances to surface water features
- Maintain equipment operating within 30 m of surface water features free of fluid leaks, invasive species, and noxious weeds
- Design and implement erosion and sediment controls (ESC) to contain/isolate the construction zone, manage site drainage/runoff and reduce the risk of erosion of exposed soils and migration of sediment to surface water features during construction and site restoration
- Maintain ESC measures until disturbed ground has been stabilized. The ESC plan should include the following items:
    - Install effective ESC measures before starting work to reduce the risk of sediment entering surface water features
    - Regularly inspect, maintain and repair ESC measures during construction
    - Remove non-biodegradable ESC materials once the site is stable
- Develop a Spill Management Plan and have it on site for implementation in the event of an accidental spill
- Stabilize and re-vegetate areas of disturbed/exposed soil, as per the rehabilitation/re-vegetation plan.

Ontario Provincial Standard Specifications

The following OPSSs are applicable to the project:

- OPSS.PROV 180 - General Specification for the Management of Excess Materials
- OPSS.PROV 182 - General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks
- SSP 101F23 – Amendment to OPSS 182, April 2021 – Timing of In-water Works, Oversight Requirements, and Measures to Avoid Harm to Fish
- OPSS.PROV 517 - Construction Specification for Dewatering
- OPSS.PROV 803 - Construction Specification for Vegetative Cover (issued in November 2020 to replace former OPSS.PROV 804)
- OPSS.PROV 804 - Construction Specification for Temporary Erosion Control (issued in April 2021 to replace the erosion control components of former OPSS 805)
- OPSS.PROV 805 - Construction Specification for Temporary Sediment Control (issued in November 2020 to replace the sediment control components of former OPSS 805)
- OPSS.PROV 825 - Construction Specification for Placement of Aggregates in Waterbodies
- OPSS.PROV 1005 - Material Specification for Aggregates - Waterbody

The OPSSs are applicable to the following general activities:

- **Equipment Use -** Use of equipment shall be in accordance with OPSS.PROV 182.
- **Dewatering and Temporary Flow Passage** - Dewatering and/or temporary flow passage shall be according to OPSS.PROV 517 and OPSS.PROV 182.
- **Fish Salvage** - Fish salvage operations shall be conducted in accordance with OPSS.PROV 182 (SSP 101F23).
- **Preservation of Riparian Vegetation** - Removal of riparian vegetation shall be in accordance with OPSS.PROV 182.

- **Erosion and Sediment Control** - Installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182, OPSS.PROV 804 and OPSS.PROV 805.
- **Placement of Aggregates in Waterbodies** - Use of aggregate in waterbodies shall be according to OPSS.PROV 825 and OPSS.PROV 1005.
- **Restoration of Disturbed Areas** - Vegetation protection and rehabilitation shall be in accordance with OPSS.PROV 182, OPSS.PROV 803 (Vegetative Cover, Non-Standard Special Provision - Amendment to OPSS.PROV 803) and OPSS.PROV 804.
- **Management of Excess Materials** - All excess material shall be managed in accordance with OPSS.PROV 180.

6.7 Potential Enhancement

The proposed widening of Highway 401 and associated culvert / drainage works under GWP 4111-22-00 are anticipated to result in minimal changes to the existing ecological footprint within confirmed fish habitat. Through field surveys, in conjunction with a review of potential impacts based on the Preferred Plan, the following enhancement opportunities for fish habitat should be considered:

- Natural channel design for realigned section of Butlers Creek
- New culvert on Butlers Creek should be installed in a manner to enhance fish passage to upstream areas including appropriate sizing and embedment, and low flow channels
- Although outside the Study Area, the removal of the beaver dam at the Unnamed Tributary to St. Lawrence River.

7.0 Preliminary Determination of HADD

Mitigation measures applicable to the proposed work that has the potential to affect fish and fish habitat are provided in Section 6.6 of this report.

An aquatic effects assessment cannot be completed until the design details are available and finalized. The assessment should be conducted during Detail Design to assess the risk of the project to result in the death of fish or HADD of fish habitat.

Although a final detailed impact assessment and the aquatic effects assessment is required during Detail Design, the preliminary review of potential impacts indicates:

- Proposed works at Butlers Creek culvert (Site 16X-039/C0) will result in the loss / destruction, alteration, creation of new of fish habitat through the removal, new culvert, and realignment. The removal of the existing Butlers Creek culvert (Site 16X-039/C0) will result in the permanent removal / infilling (Destruction) of approximately 270 m^2 of direct fish habitat. Additional permanent removal of fish habitat will also need to be calculated once realignment details are designed. Alteration of fish habitat is also anticipated at the tie-in locations of new aligned channel to existing channel at the upstream and downstream extents. The area for alteration of fish habitat will need to be calculated once realignment details are designed. It is likely that the habitat alteration (where alignment overlaps with existing) will not be harmful alterations, as the areas should continue to provide habitat for use by fish. New habitat below the 2-year high water level will also need to be calculated based on realigned area and new culvert dimensions once details are determined. The intensity and spatial scale will need to be determined at Detail Design. The effects of the impact (i.e., habitat loss) are likely not mitigable and have the potential to result in a HADD of fish habitat and will likely require review under the *Fisheries Act* through the Request for Review process. Works within 30 m of Butlers Creek, but outside the high-water level related to the proposed widening, are not anticipated to result in residual effects through implementation and adherence to standard measures outlined within OPSS.PROV.180, OPSS.PROV 517, OPSS.PROV 804, and OPSS.PROV 805.

8.0 Recommendations and Next Steps

Design details, construction methods and additional mitigation measures (if required) will be necessary to update this Preliminary Impact Assessment. Next steps are also provided in Table 5.

The design details will be used to determine if BMPs (MTO 2025b) are applicable at Step 3 of the Fisheries Protocol and/or to conduct a Fisheries Assessment at Step 4 of the Fisheries Protocol to determine/confirm if the project may result in the death of fish or HADD of fish habitat.

As part of the Fisheries Assessment at Step 4 of the Fisheries Protocol, as outlined within the Fish Guide (MTO 2025a), the following items must be completed:

- MTO Template D3 - Aquatic Effect Summary Table

- MTO Template D4 - Fish and Fish Habitat Impact Documentation

The MTO Project Notification Form(s) cannot be completed based on the Preferred Plan, since the form documents applicable BMPs or summarizes and provides supporting documentation for a Fisheries Assessment. The Project Notification Form(s) will need to be completed at Step 5 of the Fisheries Protocol for the sites where work will occur at or within 30 m of fish habitat or where there is no likelihood of causing death of fish or HADD to fish habitat. A Project Notification Form is anticipated to be applicable for the Unnamed Tributary to St. Lawrence (C5) should the beaver dam need be removed and should be confirmed during Detail Design.

The DFO Request for Review Form cannot be completed based on the Preferred Plan, since the Fisheries Protocol indicates the fisheries assessment specialist must complete and submit the Fish and Fish Habitat Documentation (MTO Template D4) for review to the MTO for approval and confirmation to proceed. The DFO Request for Review process will need to be completed at Step 6 of the Fisheries Protocol for the sites where work has the potential to result in death of fish or a HADD to fish habitat. The DFO Request for Review process and form(s) is anticipated to be required for works associated with the Butlers Creek (C1, Site 16X-039/C0) and should be confirmed during Detail Design.

9.0 Summary

The MTO has retained Stantec to undertake a Preliminary Design and Class EA for the replacement and rehabilitation of one bridge and one culvert on Highway 401 and to identify the future Highway 401 footprint for an interim six lanes and ultimate eight lanes. The GWP 4111-22-00 is from 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road (approximately 2.6 km) in the Township of Elizabethtown-Kitley.

This *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report* summarizes the fish community and fish habitat in the Study Area (GWP 4111-22-00) and provides the preliminary impact assessment for work that has the potential to affect fish and fish habitat.

Within the Study Area, two mapped watercourses directly support fish habitat for warm/cool water fish communities. Additional culvert locations under the Highway 401 were reviewed and determined to only convey roadside drainage and not provide fish habitat at or within 30 m of the locations. No records of provincially or federally regulated aquatic species were identified in watercourses within the Study Area (DFO 2025; GEO n.d.).

Design considerations include addressing a beaver dam on the Highway 401 Eastbound side of the Unnamed Tributary to St. Lawrence (C5) and the addition of riparian plantings to Butlers Creek (C1, Site 16X-039/C0).

Pending the outcome of Detail Design plans for the project, aquatic effects assessments may also be necessary at other water crossing locations assessed by Stantec in 2024 (i.e., if additional work is identified and BMPs do not apply) and/or at additional sites where fish and fish habitat may be identified during future field investigations in the Study Area.

10.0 References

Ainley Group. 2017. Environmental Screening Document: Detail Design for Culvert Rehabilitation / Replacement on Highway 401 from Mallorytown Road to Maitland Road. Prepared for MTO. May 2017.

Ainley Group. 2016. Final Culvert Condition Report, Highway 401 from Mallorytown Road to Maitland Road. Prepared for MTO. February 2016.

Fisheries and Oceans Canada (DFO). 2025. Aquatic Species at Risk Maps. Available at: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html. Accessed July 2025.

Google Earth. 2025. Aerial imagery available from Google Earth. Accessed July 2025.

Government of Ontario. no date. Geospatial Ontario (GEO) Database. Distributed and updated continuously by Ontario Government (formally Land Information Ontario). Available at: Ontario GeoHub (gov.on.ca)

Ontario Ministry of Natural Resources (MNR). 2024. Email from J. Cote (MNR, Kemptville-Kingston District) to G.MacVeigh (Stantec) in reply to a request for background information. June 18, 2024.

Ontario Ministry of Transportation (MTO). 2025a. Environmental Guide for Fisheries – Fish Guide; Version 4. Provincial and Environmental Planning Office, Ministry of Transportation Ontario.

Ontario Ministry of Transportation (MTO). 2025b. Environmental Guide for Fisheries – Best Management Practices; Version 4. Provincial and Environmental Planning Office, Ministry of Transportation, St. Catharines, Ontario.

Ontario Ministry of Transportation (MTO). 2025c. Environmental Guide for Fisheries – Maintenance Works; Version 4. Provincial and Environmental Planning Office, Ministry of Transportation, St. Catharines, Ontario.

Ontario Ministry of Transportation (MTO). 2024. Class Environmental Assessment (EA) for Provincial Transportation Facilities and Municipal Expressways. February 22, 2024. Planning and Environmental Office, Environmental Policy and Standards Branch. Ministry of Transportation, St. Catharines, Ontario.

Ontario Ministry of Transportation (MTO). 2020a. Interim Environmental Guide for Fisheries; Version 3. Provincial and Environmental Planning Office, Ministry of Transportation, St. Catharines, Ontario.

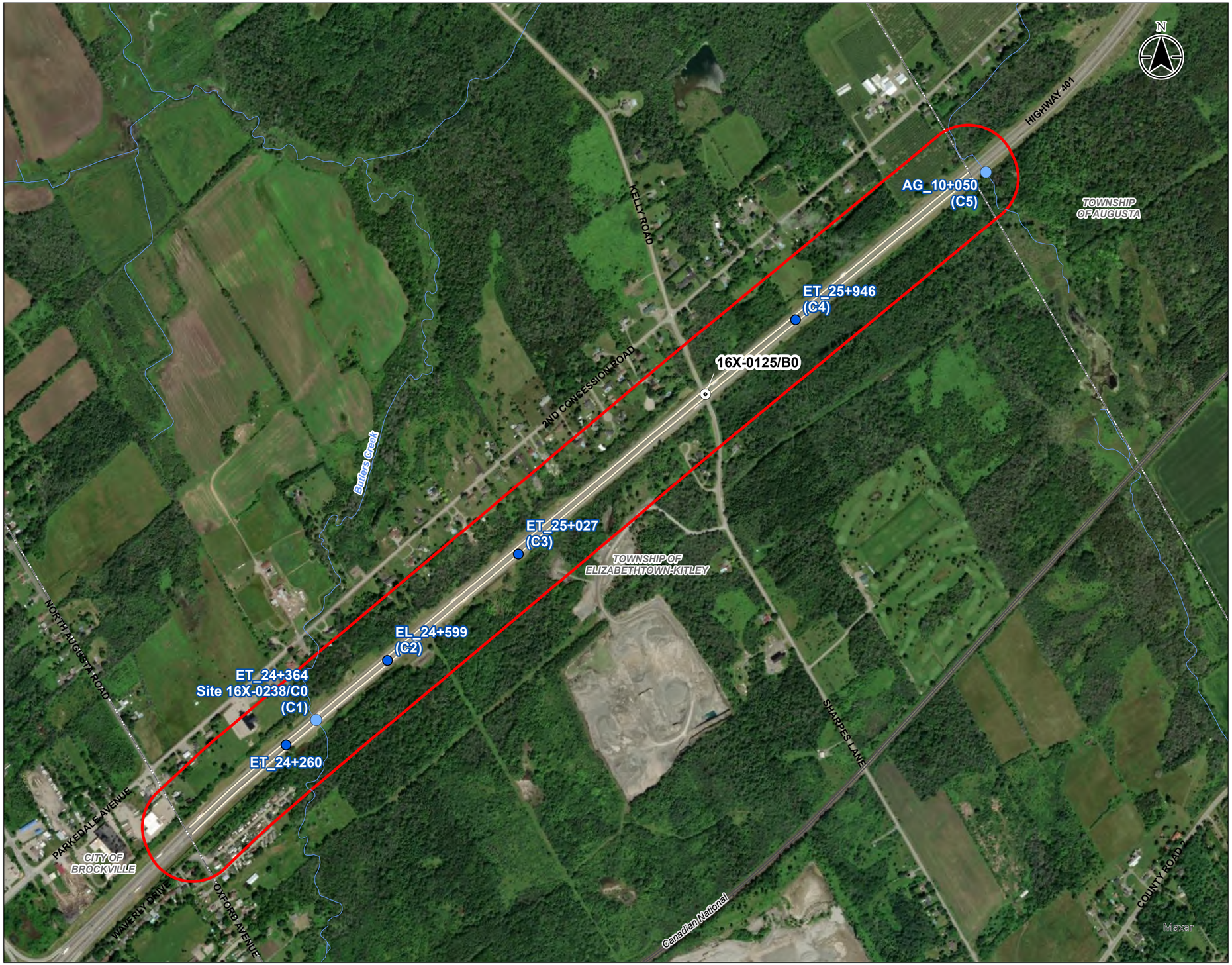
Ontario Ministry of Transportation (MTO). 2020b. MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings. Version 4, 2020.

Stantec Consulting Ltd. (Stantec). 2025a. Draft Terrestrial Ecosystems Existing Conditions Report, Highway 401 Planning Study East of Brockville – Preliminary Design and Class Environmental Assessment (GWP 4111-22-00). Prepared for Ministry of Transportation Ontario, Eastern Region.

Stantec Consulting Ltd. (Stantec). 2025b. Preliminary Drainage and Hydrology Report, Highway 401 Planning Study East of Brockville (GWP 4111-22-00). Prepared for Ministry of Transportation Ontario, Eastern Region.

Stantec Consulting Ltd. (Stantec). 2024. Fluvial Geomorphic Assessment, Highway 401 Planning Study East of Brockville (GWP 4111-22-00). Prepared for Ministry of Transportation Ontario, West Region.

Appendix A:
Figures



Stantec

Legend

- Culvert Crossing
- Watercourse Crossing
- MTO Structure
- Project Location
- Railway
- Watercourse (Permanent)
- Municipal Boundary - Lower Tier

0 250 500 Meters

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthimagery obtained from First Base Solutions, Leeds, 2008.

Project Location
United Counties of Leeds and Grenville

165001328 REVA
Prepared by jsegato on 2025-07-31
Technical Review by JWH on 2025-07-29

Client/Project
Ministry of Transportation
Highway 401 Planning Study East of Brockville (GWP 4111-22-00)

Figure No.
2

Title
Site Location

\\cd0224-pptsd01\work_group\01650\active\165001328\preliminary\gis\Maps\Aquatic\v4111-22-00_AQU_EC_Figures.aprx\1328_4111_AQU_Fig02_Site_Location Revised: 2025-07-31 By: jsegato

Stantec

Legend

- Fish Survey Point (Aquatic Resources Area)
- Direct Habitat
- Not Fish Habitat
- Flow Direction
- Beaver Dam
- Thermal Regime, Warm/Cool; Fish Habitat Present
- Watercourse (Permanent)
- Railway
- Significant Ecological Area
- MTO right-of-way
- Study Area
- Wetland, Unevaluated

0 250 500 Meters

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthimagery obtained from First Base Solutions, Leeds, 2008.

Project Location
United Counties of Leeds and Grenville

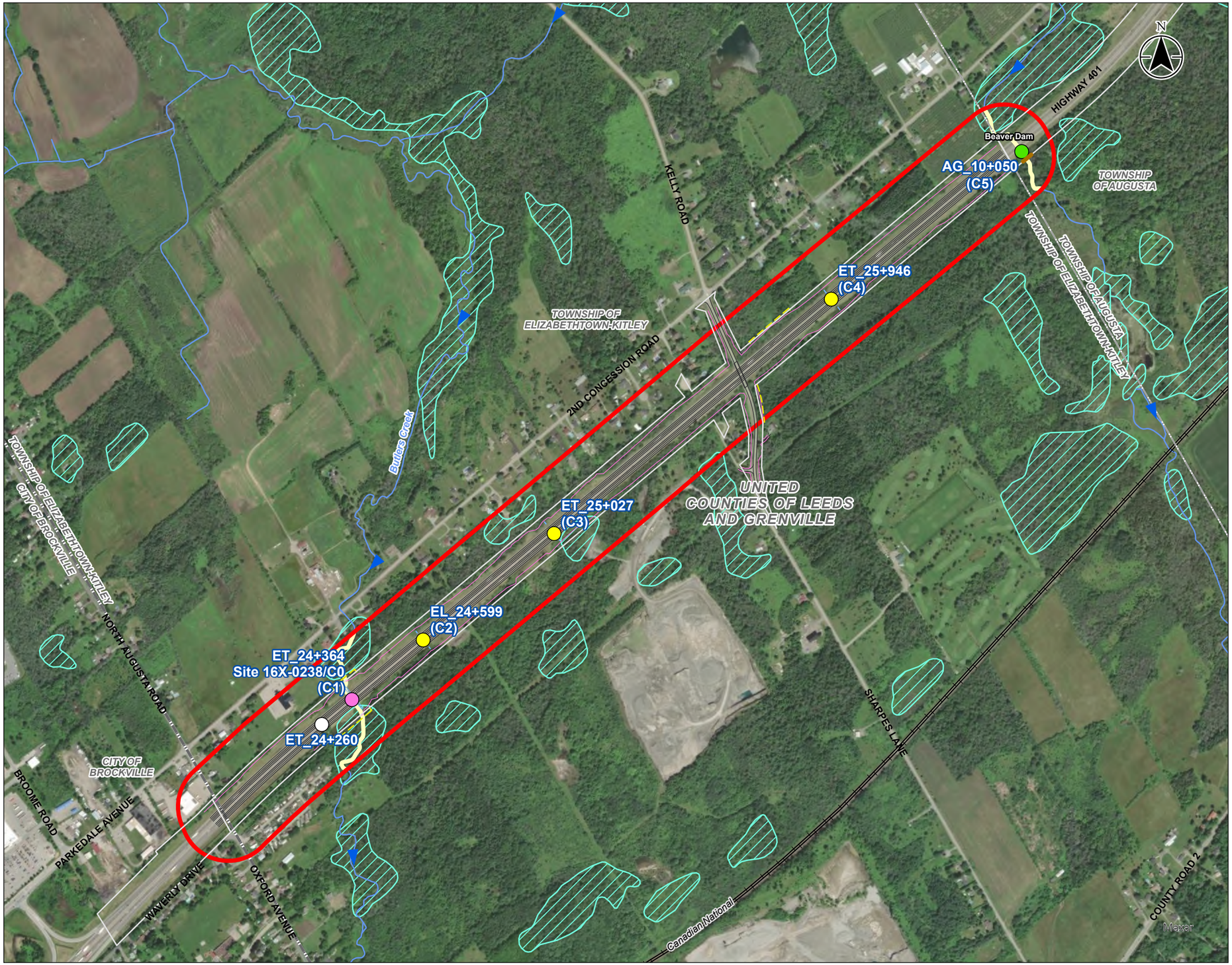
REVA
Prepared by jsegato on 2025-07-31
Technical Review by JWH on 2025-07-29

Client/Project
Ministry of Transportation
Highway 401 Planning Study East of Brockville
(GWP 4111-22-00)

Figure No.
3

Title
Existing Conditions & Constraints and Opportunities

Revised: 2025-07-31 By: jsegato



Stantec

Legend

- Fish Habitat
- Culvert Removal and Replacement, Fish Habitat
- Culvert Extension, Not Fish Habitat
- Not Fish Habitat
- Flow Direction
- Beaver Dam
- Preferred Culvert
- Proposed ROW
- Preferred Design
- Grading
- Thermal Regime, Warm/Cool; Fish Habitat Present
- Watercourse (Permanent)
- Railway
- MTO right-of-way
- Study Area
- Wetland, Unevaluated

0 250 500 Meters

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System:NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthimagery obtained from First Base Solutions, Leeds, 2008.

Project Location
United Counties of Leeds and Grenville

REVA
Prepared by jsegato on 2025-07-31
Technical Review by JWH on 2025-07-29

Client/Project
Ministry of Transportation
Highway 401 Planning Study East of Brockville (GWP 4111-22-00)

Figure No.
4

Title
Preferred Plan

\\ca0224-fpfs01\work_group\001650\active\165001328\preliminary\gis\Maps\Aquatic\4111-22-00_AQU_EC_Figures.aprx\1328_4111_AQU_Fig04_Preferred Revised: 2025-07-31 By: jsegato

Appendix B:
Agency Correspondence and Background Data

From: Cote, Joff (MNRF)
To: MacVeigh, Gina; Orr, Andrea
Cc: Cote, Joff (MNRF); Kemptville-Kingston MNRF
Subject: FW: Natural Heritage Information Request – Ministry of Transportation Highway 401 Corridor
Date: Tuesday, June 18, 2024 11:45:12 AM
Attachments: image001.png
Table 1 and 2_for_MNRF_info_request_Mallorytown__MTO2024.docx
Table 1 and 2_for_MNRF_info_request_Mallorytown__MTO2024.pdf

> Some people who received this message don't often get email from joff.cote@ontario.ca. Learn why this is important

Hi Gina/Andrea,

As requested, please see attached Tables.

Please let me know if you have any follow up questions.

Joffre Côté
Management Biologist | Regional Operations Division
Ontario Ministry of Natural Resources and Forestry | Ontario Public Service
613-302-3494
joff.cote@ontario.ca

Taking pride in strengthening Ontario, its places and its people

For General Inquiries: kemptville-kingston.MNRF@ontario.ca

Joffre Côté
Biologiste, gestion des ressources | Division des opérations régionales
Ministère des Richesses naturelles et des Forêts de l'Ontario | Fonction publique de l'Ontario
613-302-3494
joff.cote@ontario.ca

Fier de renforcer l'Ontario, ses lieux et sa population

Pour les demandes générales: kemptville-kingston.MNRF@ontario.ca

---

From: MacVeigh, Gina <Gina.MacVeigh@stantec.com>
Sent: Thursday, June 13, 2024 2:02 PM

To: Kemptville-Kingston MNRF <kemptville-kingston.mnrf@ontario.ca>
Cc: Orr, Andrea <Andrea.Orr@stantec.com>; Gazibara, Nevena <Nevena.Gazibara@stantec.com>; Werner-Hill, Julie <Julie.Werner-Hill@stantec.com>
Subject: Natural Heritage Information Request – Ministry of Transportation Highway 401 Corridor

Hello,

The Ontario Ministry of Transportation (MTO) has retained Stantec Consulting Ltd. to complete the Preliminary Design (PD) and Environmental Assessment (EA) work for the rehabilitation and/or replacement of bridges, interchange improvements and widening of Highway 401 from four to eight lanes. There are two Study Areas associated with this Assignment:

- GWP 4011-22-00 – 2.8 kilometers (km) west of Mallorytown Road to 2.1 km west of Stewart Boulevard for a total length of approximately 21.6 km.
- GWP 4111-22-00 – 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road for a total length of approximately 2.6 km.

Attached is a letter to request your input with respect to existing conditions within the Study Area, and to identify issues, concerns, or approval requirements that the Ministry of Natural Resources and Forestry (MNRF) may have.

Please let me know if you have any questions or require further information.
Thank you,

Gina MacVeigh
Senior Fisheries Biologist

Direct: 519-585-7272
Mobile: 519-901-0438
Gina.MacVeigh@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

Table 1: Fish and Fish Habitat MNRF Information Request – Highway 401 from Mallorytown to Brockville (GWP 4011-22-00)

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
YG_10+146	CV-0401-12298; CV-0401-010183	Unnamed Tributary of La Rue creek	44.453916 -75.886445	MNRF: Permanent Ainley Group: Permanent	MNRF: Warm/cool Ainley Group: Warm/cool	Direct	Clay, muck, silt, detritus	Instream: Slender Naiad, Water lily, Duckweed, Canada waterweed, Narrow-Leaved Cattail, Phragmites Riparian: Grasses, Narrow-Leaved Cattail, Mixed Forest	MNRF: No data. Stantec 2024: YOY Sunfish sp., Pumpkinseed, Northern Redbelly Dace	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_10+459	N/A	Unnamed Tributary of La Rue creek	44.456167 -75.883729	MNRF: Permanent	MNRF: Warm/cool	Direct	Clay, detritus, silt	Instream: Duckweed, Narrow-Leaved Cattail, Riparian: Grasses, Mixed Forest	MNRF 2015 Creek Chub, Pumpkinseed Stantec 2024: Central Mudminnow, Creek Chub, Fathead Minnow, Brook Stickleback, YOY Sunfish sp.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_11+025	N/A	Unnamed Tributary of La Rue creek	44.60423 -75.880276	MNRF: Permanent Stantec: Intermittent	MNRF: Warm/cool	Indirect (WBL) Direct (EBL)	Silt, bedrock	Instream: Narrow-Leaved Cattail Riparian: Grasses, Mixed Forest, pasture	MNRF 2015 Creek Chub, Northern Redbelly Dace Stantec 2024: YOY Sunfish sp.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_11+208	N/A	Unnamed Tributary of La Rue creek	44.461661 -75.879244	MNRF: Permanent	MNRF: Warm/cool	Direct	Sand, silt, clay, detritus, cobble, bedrock, boulders	Instream: Narrow-Leaved Cattail Riparian: Grasses	MNRF 2015 No fish captured. Stantec 2024: Central Mudminnow, Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_11+468	N/A	Unnamed Tributary	44.463907 -75.877551	MNRF: No data Stantec: Intermittent	MNRF: Warm/cool	No fish habitat Damaged/buried culverts WBL, no feature EBL. If connected to culverts, adjacent watercourses along EBL and WBL are considered fish habitat!	Silt, sand, gravel	Instream: Duckweed, grasses Riparian: Grasses, thicket	MNRF: No data. Stantec 2024: No fish captured.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	N/A No In-Water Work from March 15 to June 30.

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
YG_11+940	N/A	Unnamed Tributary	44.467984 -75.874145	MNRF: Permanent	MNRF: Warm/cool	Direct	Clay, gravel, silt, muck	Instream: Narrow-Leaved Cattail, duckweed, grasses Riparian: Deciduous forest	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_12+134	N/A	Unnamed Tributary	44.468998 -75.873196	MNRF: Permanent	MNRF: Warm/cool	Direct	Silt, muck, clay, boulder	Instream: Duckweed, Narrow-Leaved Cattail, grasses Riparian: Grasses, Narrow-Leaved Cattail, thicket	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_CR5_EB-NS_1a	CV-0401-001036	Unnamed Tributary	44.471282 -75.871511	MNRF: No data Ainley Group: Intermittent Stantec: Intermittent	MNRF: Warm/cool Ainley Group: warm/cool	Indirect If connected to culvert, adjacent watercourse to the south is considered fish habitat!	Silt, muck	Instream: Duckweed, Narrow-Leaved Cattail, Riparian: Grasses	MNRF: No data. Stantec 2024: No fish community assessment completed as water only present within culvert (not accessible)	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_CR5_EB-NS_1b	CV-0401-001037	N/A - manhole only, not feature present	44.471062 -75.871411	MNRF: No data Ainley Group: Ephemeral Stantec: No feature	MNRF: No data Ainley Group: warm/cool	Ainley Group: Indirect Stantec: Not fish habitat	N/A	N/A	MNRF: No data. Stantec 2024: Manhole, no fish community assessment completed.		Ainley Group: July 1 to March 14 N/A
YG_CR5_NS-EB	CV-0401-001038	Tributary of Unnamed Wetland	44.472464 -75.870546	MNRF: No data Ainley Group: Intermittent Stantec: Ephemeral/ Intermittent	MNRF: Warm/cool Ainley Group: warm/cool	Ainley Group: Indirect Stantec: Not fish habitat Could potentially be fish habitat in the spring.	Silt	Instream: Grasses Riparian: Grasses	MNRF: No data. Stantec 2024: No fish community assessment completed due to insufficient water.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 N//A No In-Water Work from March 15 to June 30.
YG_CR5_N	N/A	Unnamed Tributary	44.476667 -75.871609	MNRF: No data Stantec: Intermittent	MNRF: Warm/cool	Direct	Silt, muck, detritus	Instream: Narrow-Leaved Cattail, Grasses, Spike Rush Riparian: Grasses	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_CR5_S	N/A	Unnamed Tributary	44.473294 -75.868903	MNRF: No data	MNRF: Warm/cool	Not fish habitat	Silt	Instream: Terrestrial Vegetation, Moss	MNRF: No data. Stantec 2024:	Forage/Bait Fish Production and (Traditional and Non-Traditional)	N/A

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
				Stantec: Ephemeral/ Intermittent		Could potentially be fish habitat in the spring.		Riparian: Thicket	No fish community assessment completed due to insufficient water, no connectivity to any feature.	Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_CR5_EB-NS_2	CV-0401-001039	Tributary of Unnamed Wetland	44.472243 -75.868011	MNRF: No data Ainley Group: Intermittent Stantec: Intermittent, refuge pool at culvert	MNRF: Warm/cool Ainley Group: warm/cool	Ainley Group: Indirect Stantec: Direct	Silt, muck, clay	Instream: Chara, Narrow-Leaved Cattail Riparian: Grasses	MNRF: No data. Stantec 2024: Central Mudminnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_13+420 Equalization drainage from median into EBL ditchline	N/A	Unnamed Tributary	44.479058 -75.864820	MNRF: Permanent adjacent to HWY EBL and WBL.	MNRF: Warm/cool	TBD	Silt, gravel, sand	Instream: Narrow-Leaved Cattail Riparian: Grasses	MNRF: No data. Stantec 2024: No fish captured.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_13+757 Equalization drainage from median to EBL ditch, no culvert WBL	N/A	Unnamed Tributary	44.481629 -75.862491	MNRF: No data Stantec: Ephemeral/ Intermittent	MNRF: Warm/cool	Direct	Silt	Instream: Narrow-Leaved Cattail, Watercress, Water Plantain Riparian: Grasses	MNRF 2018: Brook Stickleback, Central Mudminnow, Creek Chub, Finescale Dace Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_14+323	N/A	Unnamed Tributary	44.485589 -75.858642	MNRF: Permanent	MNRF: Warm/cool	Direct	Bedrock, detritus, muck, silt, cobble, gravel	Instream: Narrow-Leaved Cattail, Watercress, Riparian: Deciduous forest	MNRF: No data. Stantec 2024: Brook Stickleback, Central Mudminnow, Creek Chub	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_OR_WB_1	CV-0401-001475	Unnamed Tributary of Little Mud Creek	44.487681 -75.857628	MNRF: Permanent Ainley Group: Permanent	MNRF: Warm/cool Ainley Group: Warm/cool	Direct	Silt, clay, bedrock	Instream: Narrow-Leaved Cattail, Watercress, Water Speedwell Riparian: Deciduous forest	MNRF: No data. Stantec 2024: Creek Chub, Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_OR_WB_2	CV-04010991474	Unnamed Tributary of Little Mud Creek	44.490214 -75.855119	MNRF: Permanent Ainley Group:	MNRF: Warm/cool Ainley Group:	Ainley Group: Indirect Stantec:	Silt	N/A	MNRF: No data. Stantec 2024:	Forage/Bait Fish Production and (Traditional and Non-Traditional)	Ainley Group: July 1 to March 14 N/A

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
				Ephemeral Stantec: No feature.	Warm/cool	Not fish habitat Could potentially be fish habitat in the spring.			Drain cover with no obvious input or output, no fish community assessment completed.	Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_15+058	N/A	Unnamed Tributary of Little Mud Creek	44.491261 -75.852429	MNRF: Permanent	MNRF: Warm/cool	Direct	Cobble, gravel, sand, silt	Instream: Narrow-Leaved Cattail Riparian: Grasses, Deciduous Forest	MNRF: No data. Stantec 2024: Creek Chub (spawning adults), Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_15+430	N/A	Unnamed Tributary of Little Mud Creek	44.493897 -75.849586	MNRF: Adjacent tributary to the South is permanent. Stantec: Intermittent	MNRF: Warm/cool	Direct	Silt, sand, detritus	Instream: Narrow-Leaved Cattails, Watercress, Duckweed, Phragmites, Water Speedwell Riparian: Narrow-Leaved Cattail Marsh, Coniferous Forest	MNRF 2018: Brook Stickleback, Central Mudminnow, Creek Chub, Fathead Minnow Stantec 2024: Northern Redbelly Dace, Creek Chub, Brook Stickleback, Fathead Minnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_15+675	N/A	Little Mud Creek	44.495261 -75.848131	MNRF: Permanent	MNRF: Warm/cool	Direct	Silt, muck, detritus	Instream: Narrow-Leaved Cattails, Watercress, Water Speedwell Riparian: Grasses, Narrow-Leaved Cattail Marsh	MNRF 2018: Brook Stickleback, Central Mudminnow, Creek Chub, Finescale Dace DFO 2024: Grass Pickerel Stantec 2024: Central Mudminnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_15+823	CV-0401-001477	Unnamed Tributary of Little Mud Creek	44.496341 -75.846851	MNRF: Adjacent tributary to the South is permanent. Ainley Group: Intermittent Stantec: Intermittent	MNRF: Warm/cool Ainley Group: Warm/cool	Ainley Group: Direct Stantec: Direct	Silt, muck, clay, detritus	Instream: Narrow-Leaved Cattails, Watercress Riparian: Grasses, Mixed Forest	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_16+290/ YG_16+190	CV-0401-001478	Median Drainage to Unnamed Tributary of Little Mud Creek	44.499143 -75.844950	MNRF: Adjacent tributaries to the North and	MNRF: Warm/cool	Ainley Group: Indirect	Silt, muck	Instream: Duckweed, Narrow-Leaved Cattails	MNRF: No data.	Forage/Bait Fish Production and (Traditional and	Ainley Group: July 1 to March 14

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
Feature not visible on WBL, culvert on EBL heavily damaged.				South are permanent. Ainley Group: Intermittent Stantec: Intermittent	Ainley Group: Warm/cool	Stantec: Direct		Riparian: Grasses, Mixed Forest	Stantec 2024: Brook Stickleback	Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_17+452	CV-0401-012243; 001458	N/A	44.507994 -75.835084	MNRF: No data Ainley Group: Dry Stantec: Dry	MNRF: No data	Ainley Group: Not fish habitat. Stantec: Not fish habitat.	Silt	Instream: N/A Riparian: Grasses	MNRF: No data. Stantec 2024: No feature present.	N/A	N/A
YG_18+240	N/A	Jones Creek/ Jones Creek Municipal Drain	44.514103 -75.830987	MNRF: Permanent	MNRF: Warm/cool	Direct	Assessed at CR2 crossing: Boulders	Assessed at CR2 crossing: Instream: None Riparian: Mixed Forest	MNRF: No data DFO 2024: Grass Pickerel Stantec 2024: Central Stoneroller, White Sucker	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_18+560	CV-0401-001469	Unnamed Tributary to Jones Creek	44.515904 -75.826162	MNRF: Permanent Ainley Group: Permanent	MNRF: Warm/cool Ainley Group: Warm/cool	Direct	Stantec not assessed at 401 due to no safe access.		MNRF: No data DFO 2024: Grass Pickerel Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_18+960	N/A	Unnamed Tributary to Jones Creek	44.517014 -75.821268	MNRF: Permanent	MNRF: Warm/cool	Direct	Stantec not assessed at 401 due to no safe access.		MNRF 2019: Central Mudminnow DFO 2024: Grass Pickerel Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_19+273	CV-0401-001460	Unnamed Tributary to MacIlhennys Creek	44.517852 -75.817661	MNRF: Adjacent tributary to the South is permanent.	MNRF: Warm/cool Ainley Group: Warm/cool	Direct MNRF confirmed Northern Pike spawning site.	Stantec not assessed at 401 due to no safe access.		MNRF 2024: Northern Pike DFO 2024:	Forage/Bait Fish Production and (Traditional and Non-Traditional)	Ainley Group: July 1 to March 14

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
				Ainley Group: Intermittent		Confirmed spawning site for Yellow Perch, Smallmouth Bass, Largemouth Bass and Pumpkinseed, as well.			Eastern Pondmussel Stantec 2024: No fish community assessment due to no safe access to watercourse.	Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_19+325 Could not find on map!	CV-0401-001483	N/A	44.517844 -75.517844	MNRF: No data Ainley Group: Dry Stantec: Dry	MNRF: No data	Ainley Group: Not fish habitat. Stantec: Not fish habitat.	Silt	Instream: N/A Riparian: Grasses	MNRF: No data. Stantec 2024: No feature present.		
YG_19+920	N/A	MacIlhennys Creek	44.519332 -75.809800	MNRF: Permanent	MNRF: Warm/cool	Direct	Stantec not assessed at 401 due to no safe access.		MNRF: No data DFO 2024: Eastern Pondmussel Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_20+087	CV-0401-001461	Unnamed Tributary of MacIlhennys Creek	44.519888 -75.807822	MNRF: Permanent Ainley Group: Permanent	MNRF: Warm/cool Ainley Group: Warm/cool	Ainley Group: Indirect Direct	Stantec not assessed at 401 due to no safe access.		MNRF: No data DFO 2024: Eastern Pondmussel Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
YG_21+135	N/A	Unnamed Tributary to St. Lawrence	44.519075 -75.795464	MNRF: Permanent	MNRF: Warm/cool	Direct	Silt, detritus	Instream: Narrow-Leaved Cattail, Water Speedwell, Grasses, Duckweed Riparian: Thicket, Narrow-Leaved Cattail Marsh	MNRF: No data Stantec 2024: Brook Stickleback, Northern Redbelly Dace, Central Mudminnow, Fathead Minnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
YG_SS_9+902	CV-0401-001548	N/A	44.521241 -75.803058	MNRF: No data	MNRF: No data	Ainley Group: Not fish habitat.	Silt	Instream: N/A Riparian: Grasses	MNRF: No data.		N/A

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
Could not find on map!				Ainley Group: Dry Stantec: Dry		Stantec: Not fish habitat.			Stantec 2024: No feature present.		
ET_22+070	N/A	Unnamed Tributary to St. Lawrence	44.520524 -75.782107	MNRF: Permanent	MNRF: Warm/cool	Direct	Boulder, cobble, silt, clay	Instream: Water Smartweed, Horsetail Riparian: Deciduous Forest	MNRF 2018: Book Stickleback, Central Mudminnow, Pumpkinseed Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_10+893	CV-0401-012244, 002214, 002245	N/A	44.525942 -75.771069	MNRF: No data Ainley Group: Dry Stantec: Dry	MNRF: No data	Ainley Group: Not fish habitat. Stantec: Not fish habitat.	Silt	Instream: N/A Riparian: Grasses	MNRF: No data. Stantec 2024: No feature present.		N/A
EL_11+275 Could not find on map!	CV-0401-001579	N/A	44.528552 -75.768663	MNRF: No data Ainley Group: Dry Stantec: Dry	MNRF: No data	Ainley Group: Not fish habitat. Stantec: Not fish habitat.	Silt	Instream: N/A Riparian: Grasses	MNRF: No data. Stantec 2024: No feature present.		N/A
ET_11+946	CV-401-001470	Unnamed Tributary to Cole Creek	44.534531 -75.767426	MNRF: Permanent Ainley Group: Permanent Stantec: Intermittent	MNRF: Warm/cool Ainley Group: Warmwater	Direct	Gravel, sand, silt, muck, detritus	Instream: Narrow-Leaved Cattails, Water Smartweed Riparian: Marsh, thicket	MNRF 2018: Book Stickleback, Central Mudminnow, Creek Chub, Fathead Minnow, Finescale Dace Stantec 2024: Creek Chub YOY, Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	Ainley Group: July 1 to March 14 No In-Water Work from March 15 to June 30.
ET_12+417	N/A	Unnamed Tributary to Cole Creek	44.538818 -75.767743	MNRF: Permanent Stantec: Intermittent	MNRF: Warm/cool	Direct	Silt, muck, detritus	Instream: Narrow-Leaved Cattails, Marsh Marigold Riparian: Marsh, Mixed Forest	MNRF: No data. Stantec 2024: Brook Stickleback, Central Mudminnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
ET_12+685 No visible culvert	N/A	Cole Creek	44.541335 -75.768001	MNRF: No data	MNRF: Warm/cool	Direct (WBL)	Silt, muck, detritus	Instream: Narrow-Leaved Cattails Riparian: Narrow-Leaved Cattail Marsh, Mixed Forest	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_13+732	N/A	Unnamed Tributary to Grants Creek	44.550028 -75.764738	MNRF: Adjacent tributary to the South is permanent. Stantec: Intermittent	MNRF: Warm/cool	TBD Could potentially be fish habitat in the spring!	Silt, muck, clay	Instream: Narrow-Leaved Cattails, grasses Riparian: Narrow-Leaved Cattail Marsh, Mixed Forest	MNRF: No data. Stantec 2024: No fish captured.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_14+224	N/A	Unnamed Tributary to Grants Creek	44.553311 -75.761098	MNRF: Permanent	MNRF: Warm/cool	Direct	Silt, clay, muck, detritus	Instream: Narrow-Leaved Cattails, Water Lily Riparian: Narrow-Leaved Cattail Marsh, Mixed Forest	MNRF: No data. Stantec 2024: Central Mudminnow, Creek Chub, Brook Stickleback, Fathead Minnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_15+073	N/A	Grants Creek	44.558479 -75.753030	MNRF: Permanent Stantec: Intermittent	MNRF: Warm/cool	Direct	Silt, clay, muck, detritus	Instream: Narrow-Leaved Cattail Riparian: Narrow-Leaved Cattail Marsh	MNRF: No data. Stantec 2024: Central Mudminnow	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_15+332	N/A	Unnamed Tributary to Grants Creek	44.560013 -75.750563	MNRF: Permanent Stantec: Intermittent	MNRF: Warm/cool	Direct	Silt, muck	Instream: Narrow-Leaved Cattail Riparian: Narrow-Leaved Cattail Marsh, Mixed Forest	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_16+800	N/A	Grants Creek	44.569854 -75.738258	MNRF: Permanent	MNRF: Warm/cool	Direct	Boulder, silt, clay	Instream: Narrow-Leaved Cattail, Phragmites Riparian: Grasses, Mixed Forest, Deciduous Swamp	MNRF: No data. Stantec 2024: Creek Chub, Northern Redbelly Dace, Central Mudminnow, Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
ET_18+538	N/A	Unnamed Tributary to Grants Creek	44.584020 -75.729444	MNRF: No data Stantec: Permanent	MNRF: Warm/cool	Direct	Cobble, sand, silt, clay, detritus	Instream: Narrow-Leaved Cattail, Phragmites Riparian: Thicket, Deciduous Forest	MNRF: No data. Stantec 2024:	Forage/Bait Fish Production and (Traditional and Non-Traditional)	No In-Water Work from March 15 to June 30.

Location (Crossing ID, see Attachment A)	Ainley Group Report Crossing ID (Ainley Group 2024)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Ainley Group 2024; Stantec 2024)	Thermal Regime (MNRF 2024b; Ainley Group 2024)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024b, DFO 2024, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window (Ainley Group 2024)
									Brook Stickleback, Creek Chub	Sport Fish Reproduction	
ET_19+205	N/A	Unnamed Tributary to Grants Creek	44.587313 -75.722375	MNRF: Permanent	MNRF: Warm/cool	Direct	Stantec not assessed at 401 due to no safe access.		MNRF: No data Stantec 2024: No fish community assessment due to no safe access to watercourse.	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.

Table 2: Fish and Fish Habitat MNRF Information Request – Highway 401 and East of Brockville (GWP 4111-22-00)

Location (Crossing ID, see Attachment A)	Waterbody Name (MNRF 2024a, MNRF 2024b)	Waterbody Coordinates (Lat/Long)	Flow Regime (MNRF 2024b; Stantec 2024)	Thermal Regime (MNRF 2024b)	Fish Habitat Present	Habitat - Substrate (Stantec)	Habitat - Vegetation (Stantec)	Fish Species Present (MNRF 2024a, Stantec 2024)	MNRF Fisheries Management Objective	In-water Works Timing Window
ET_24+364	Butler's Creek	44.618386 -75.674432	MNRF: Permanent	MNRF: Warm/cool	Direct	Clay, cobble, boulder, gravel, sand	Instream: Crisp Pondweed, Filamentous Algae, Canada Waterweed Riparian: Grasses	MNRF: No data. Stantec 2024: Brook Stickleback, Central Mudminnow, Brown Bullhead, Johnny/Tesselated Darter	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.
AG_10+050	Unnamed Tributary to St. Lawrence	44.631124 -75.653461	MNRF: Permanent	MNRF: Warm/cool	Direct	Silt, muck, clay, gravel	Instream: Watercress, Slender Naiad, Riparian: Grasses	MNRF: No data. Stantec 2024: Brook Stickleback	Forage/Bait Fish Production and (Traditional and Non-Traditional) Sport Fish Reproduction	No In-Water Work from March 15 to June 30.

Notes:
ROW - right-of-way
N/A - not applicable
YOY - young-of-year
EBL – Eastbound Lane
WBL – Westbound Lane

REFERENCES:

Ainley Group. 2024. Fish and Fish Habitat Existing Conditions and Impact Assessment Report for WP 4056-23-01. Highway 401 from Mallorytown Road to Country Road 2. Prepared for Ontario Ministry of Transportation. February 2024.

DFO. 2024. Aquatic species at risk map. Accessed June 2024. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

MNRF. 2024a Natural Heritage Information Centre (NHIC) Data on the Land Information Ontario mapping website. Ontario Ministry of Natural Resources and Forestry. Available Online: https://www.ontario.ca/page/make-natural-heritage-area-map

MNRF. 2024b Land Information Ontario Digital mapping of natural heritage features, Ontario Ministry of Natural Resources. Available Online: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

Appendix C:
Field Notes

Site: ET_24+364_EB

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-04-30
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Chung			Time Started: 08:17	Time Finished:
Weather Conditions: Overcast				
Air Temp (°C): 10.0	Dissolved Oxygen (mg/L) 7.9	Water Temp (°C): 11.3	Conductivity (µS/cm): 593.0	Velocity (m/s):
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Butlers Creek	Drainage System:	Crossing #/ Stantec Station ID: ET_24+364_EB	Station #: 24+364
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.61838614151068, -75.6744315036689		MTO Chainage: 24+364	
Township: Elizabethtown		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous forest	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☐ Box Culvert ☑ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Eastbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River	
Total Section (Reach) Length (m): 30.0	

Sub-Sections:	☑ Run	☑ Pool	☐ Riffle	☐ Flats	☐ Culvert	☐ Other
Percentage of Area:	60.0	40.0				
Mean wetted depth (m)	0.2	0.3				
Mean wetted width (m)	1.5	3.5				
Mean bankfull depth (m)	0.5	0.6				
Mean bankfull width (m)	2.5	4.0				
Substrate (type & %)	Bo 20 Co 30 Gr 10 Cl 40	Bo 30 Co 10 Cl 60				

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☑	☐	☐
Right Bank	☐	☐	☑	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☐	☑

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: 5.0	Boulders: 15.0	Cobbles: 5.0	Organic Debris: 5.0	None ☐

Vascular Macrophytes: Instream: 5.0 Overhanging: 5.0	Woody Debris: Instream: Overhanging: 5.0

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☑	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent: 60.0	Floating:	Emergent: 40.0	None ☐

Predominant Species:	Potomageton crispus, filamentous algae		Grasses, blue flag	

MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal No	None None

POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES

ADDITIONAL COMMENTS

Additional Notes Appended? ○ No ○ Yes Number of Pages _____

Site: ET_24+364_WB

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-04-30
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Chung			Time Started: 09:51	Time Finished:
Weather Conditions:				
Air Temp (°C): 10	Dissolved Oxygen (mg/L) 7.9	Water Temp (°C): 11.3	Conductivity (µS/cm): 593.0	Velocity (m/s): Moderate
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Butlers Creek	Drainage System:	Crossing #/ Stantec Station ID: ET_24+364_WB	Station #: 24+364
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.618792493770805, -75.6748767966653		MTO Chainage: 24+364	
Township: Elizabethtown		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use:	Sources of Pollution:
EXISTING STRUCTURE TYPE	
☐ Bridge ☐ Box Culvert ☑ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Westbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River	
Total Section (Reach) Length (m): 50.0	

Sub-Sections:	☑ Run	☐ Pool	☐ Riffle	☐ Flats	☐ Culvert	☐ Other
Percentage of Area:	100.0					
Mean wetted depth (m)	0.2					
Mean wetted width (m)	2.0					
Mean bankfull depth (m)	0.4					
Mean bankfull width (m)	2.5					
Substrate (type & %)	Bo 5 Co 5 Gr 5 Sa 20 Cl 65					

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☑	☐	☐
Right Bank	☐	☑	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☐	☑
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: 5.0	Boulders: 5.0	Cobbles: 5.0	Organic Debris:	None ☐

Vascular Macrophytes: Instream: 20.0 Overhanging:	Woody Debris: Instream: 5.0 Overhanging:

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☑	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent: 90.0	Floating:	Emergent: 10.0	None ☐

Predominant Species:	Canada waterweed, grasses		Grasses	

MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal No	None None

POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES
Riparian enchancemenrs

ADDITIONAL COMMENTS

Additional Notes Appended? ○ No ○ Yes Number of Pages _____

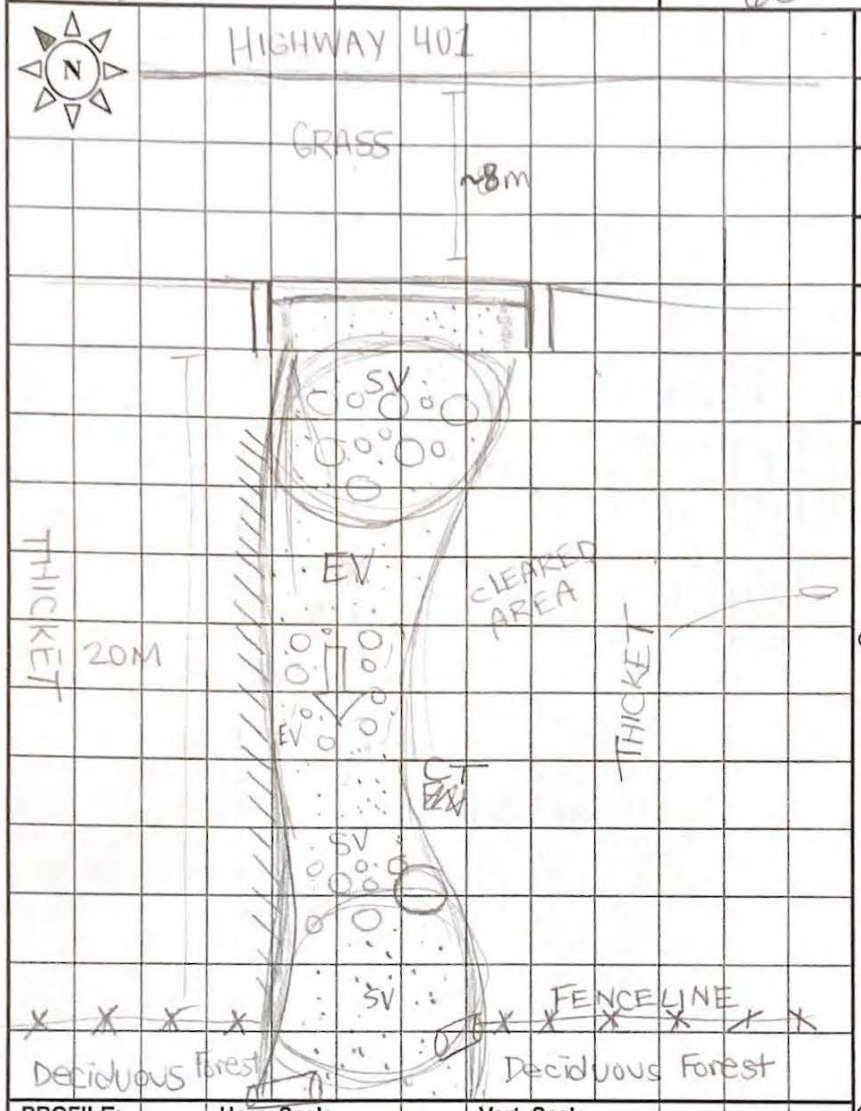
36 EBL

Site: 36

Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m): (unless written otherwise)
Eastland		60	1cm / 1m



PROJECT #:	MAPPER:	NAME OF WATERBODY:	CROSSING #:	STATION #: chainage	DATE: YY-MMM-DD
16500328	MC	Butler's Creek		24+364	~~24-04-30~~ 24-APR-30

LEGEND

10d depth (cm)
6w width

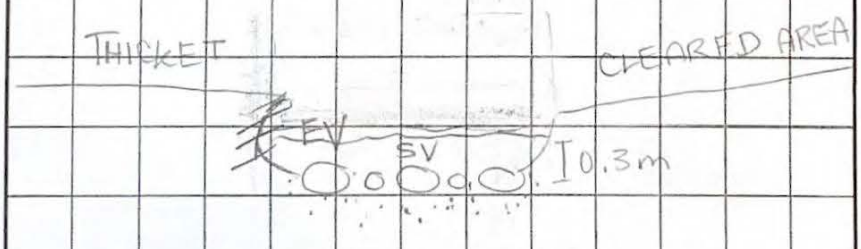
➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submergent/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
//////// Eroded Bank
xxx Riprap/Other Stabilization
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree

⊢► Seep/Spring
-------- Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale** 10m/1m



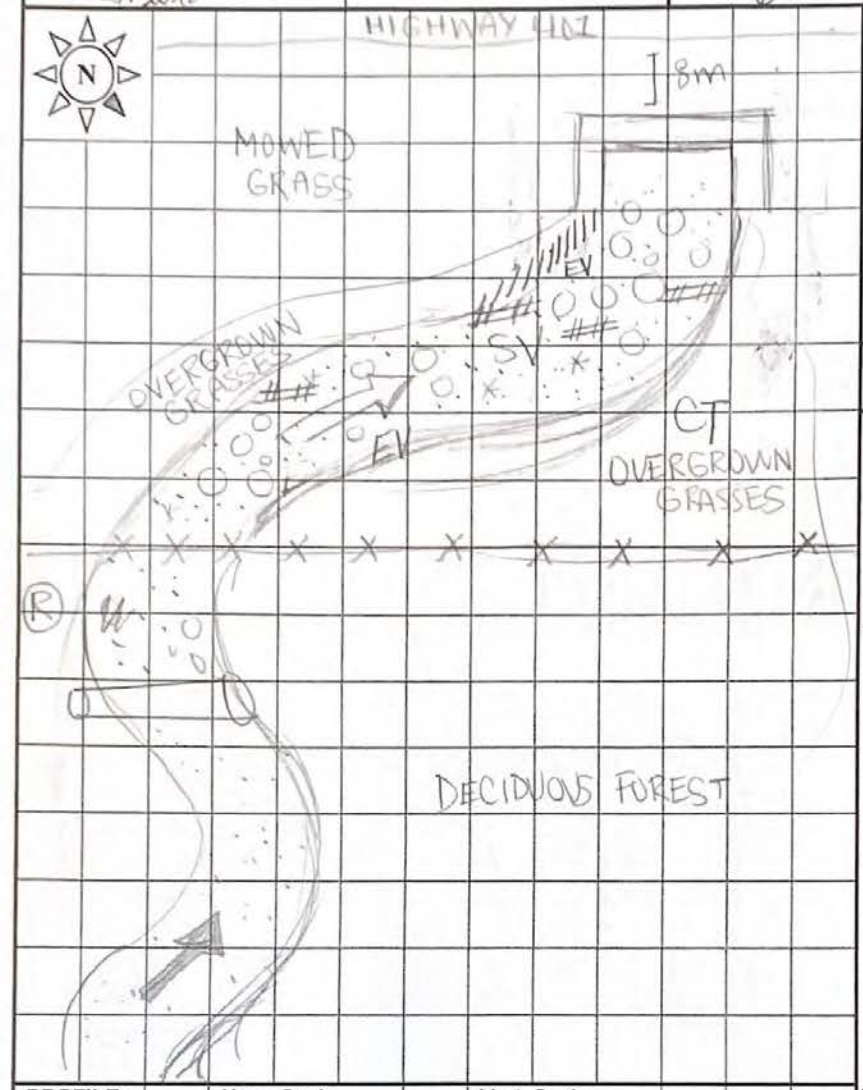
36 WBL

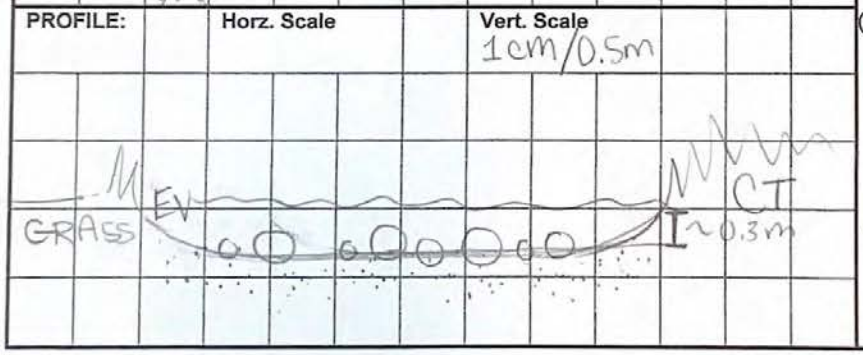
Site: 36

Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Northbound		60	1cm / 2m





PROJECT #: 165001328
MAPPER: MC
NAME OF WATERBODY: Butlers Creek
CROSSING #:
STATION #: 24+364
DATE: YY-MMM-DD 24-04-30 ~~24-APR-30~~

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** * *** Debris

CT Cattail
SV/FV Submergent/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
//////// Eroded Bank
xxx Riprap/Other Stabilization
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction
Ⓡ Riparian Tree

⊢▶ Seep/Spring
-------- Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
⌴ Culvert

36 WB

Site: 36

Ministry of Transportation

Ontario

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION

Project #	Date:
16500328	April 30/24

Project Description:
MTO 401 Mallorytown

Collectors:	Time Started:	Time Finished:
Brooke Chung	1330	1400

Weather Conditions:	Surface Conditions (If Applicable):			
	Calm	Rippled	Wavy	Rough
100% cc	○	○	○	○

LOCATION

Name of Waterbody:	Crossing #:	Station #:
Butlers Creek	36	24+364

Location of Crossing/Station:
GWP 4111-22-00

GPS Coordinates:	MTO Chainage:
18T 446474 4940804	24+364
Township:	**MNRF District:**
Elizabethtown	Kemptville Kingston

SAMPLING LOCATIONS AND WATER CHEMISTRY

Location:	Length (m)	Air Temp. (˚C)	pH	Dissolved Oxygen (mg/L)	Water Temp (˚C)	Conductivity (µS/cm)
Upstream						
Downstream						
Culvert/Hwy ROW	-	10	8.07	7.90	11.3	593

Water Colour:

Colourless	Yellow/Brown	Blue/Green	Turbid	Other
○	○	○	○	○ _____

GEAR		
Electrofisher:		
Length (m): 70	Settings: 50 Hz, 150 V	Seconds: 170
Nets and Traps:		
Minnow Trap: O #	Dip Net O #	Trap Net O #
Seine: O	Gill O	Other O Specify:
Hauls (#):	Period of Time (24 Hour Clock):	
	Set Time:	Clear Time:
Size of Net:		
Length (m):	Mesh Size:	Depth of Capture:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
Fish Kept? O Yes ~~O~~ No	Number of Bags	Preservative:			
		Formalin O	Frozen O	Alcohol O	Other (specify) O

ADDITIONAL COMMENTS

Brook stickleback 28
Central Mudminnow 37
Brown Bullhead 2
Johnny/Tessalated ~~3~~ 5
~~Darter~~ ~~3~~

Additional Notes Appended? ☑ No ☐ Yes number of pages _____

Site: AG_10+050_EB

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-04-30
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Chung			Time Started: 08:53	Time Finished:
Weather Conditions: Overcast				
Air Temp (°C): 10.0	Dissolved Oxygen (mg/L) 5.5	Water Temp (°C): 10.9	Conductivity (µS/cm): 620.0	Velocity (m/s):
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Unknown	Drainage System:	Crossing #/ Stantec Station ID: AG_10+050_EB	Station #: 10+050
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.63112425505489, -75.65346097851024		MTO Chainage: 10+050	
Township: Augusta		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous swamp	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☑ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Eastbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River	
Total Section (Reach) Length (m): 50.0	

Sub-Sections:	☐ Run	☐ Pool	☐ Riffle	☑ Flats	☐ Culvert	☑ OtherDrainage ditch Avg wet width 0.7, avg
Percentage of Area:				95.0		5.0
Mean wetted depth (m)				0.6		
Mean wetted width (m)				15.0		
Mean bankfull depth (m)				0.6		
Mean bankfull width (m)				6.0		
Substrate (type & %)				Si 60 Cl 10 Mu 30		

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☑	☐	☐
Right Bank	☐	☑	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☑	☐	☐	☐
Right Bank	☑	☐	☐	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None ☐

Vascular Macrophytes: Instream: 10.0 Overhanging:	Woody Debris: Instream: 35.0 Overhanging: 5.0

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☑	59-30% ☐	29-1% ☐	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent: 30.0	Floating:	Emergent: 70.0	None ☐
Predominant Species:	Slender naiad		Grasses	

MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal Yes Early stage beaver dam	None
POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater Yes Sparse watercress	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
Drainage ditch from west has at least seasonal habitat for 50 m upstream of WC37 (BRST observed). WC37 impounded by early stage beaver dam 30 m downstream of culvert, WC37 is over bankfull conditions, flow diffuse through wide area		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

Site: AG_10+050_WB

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-04-30
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Chung			Time Started: 09:22	Time Finished:
Weather Conditions: Overcast				
Air Temp (°C): 10.0	Dissolved Oxygen (mg/L) 5.5	Water Temp (°C): 10.9	Conductivity (µS/cm): 620	Velocity (m/s):
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Unknown	Drainage System:	Crossing #/ Stantec Station ID: AG_10+050_WB	Station #: 10+050
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.63146449787183, -75.65411442604864		MTO Chainage: 10+050	
Township: Augusta		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use:	Sources of Pollution:
EXISTING STRUCTURE TYPE	
☐ Bridge ☑ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Westbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River	
Total Section (Reach) Length (m): 50.0	

Sub-Sections:	☑ Run	☐ Pool	☐ Riffle	☑ Flats	☐ Culvert	☐ Other
Percentage of Area:	50.0			50.0		
Mean wetted depth (m)	0.4			0.5		
Mean wetted width (m)	4.0			8.0		
Mean bankfull depth (m)	0.7			1.0		
Mean bankfull width (m)	4.5			12.0		
Substrate (type & %)	Gr 5 Si 35 Cl 60			Si 80 Cl 20		

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☐	☑	☐
Right Bank	☐	☑	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☐	☑
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None ☐
Vascular Macrophytes: Instream: Overhanging: 10.0		Woody Debris: Instream: 40.0 Overhanging: 20.0		
Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☑	59-30% ☐	29-1% ☐	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None ☐
Predominant Species:				

MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal	None
POTENTIAL CRITICAL HABITAT		
Spawning	Groundwater	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
Westbound lane impounded from downstream dam, beaver hut near culvert. Small drainage ditch from southwest but only seasonal habitat for 10 m		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

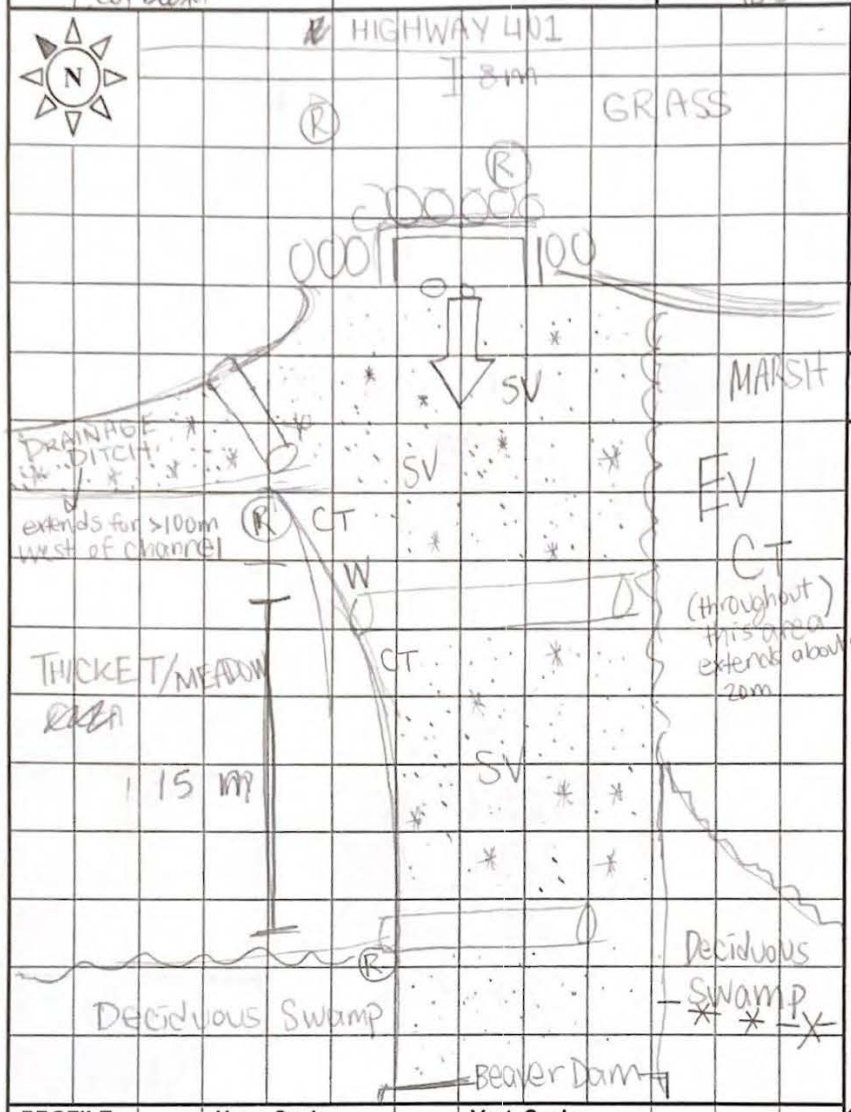
37 EBL

Site: 37

Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m): (unless otherwise stated)
Eastbound		60	1cm / 1m



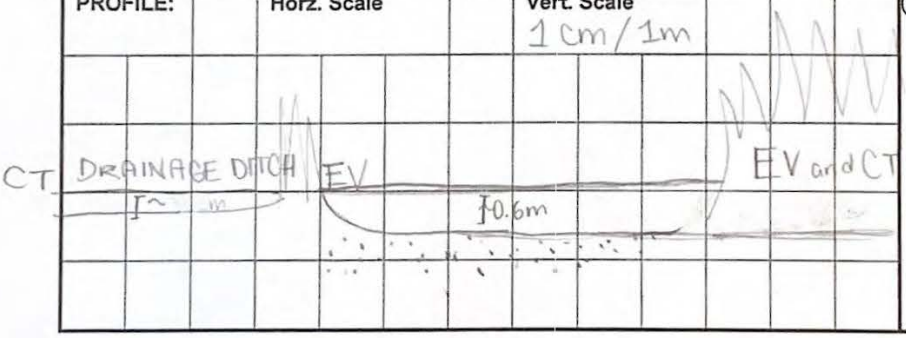
CT 20m west of culvert

PROJECT #:
165001328
MAPPER:
MC
NAME OF WATERBODY:
Unknown
CROSSING #:
STATION #:
10+050
DATE: YY-MMM-DD
24-APR-30

LEGEND

- 10d depth (cm)
- 6w width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ▒ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submergent/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- xxx Riprap/Other Stabilization
- ⊂⊃ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- ├► Seep/Spring
- ------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⌴ Culvert

PROFILE: Horz. Scale — Vert. Scale 1 cm / 1m



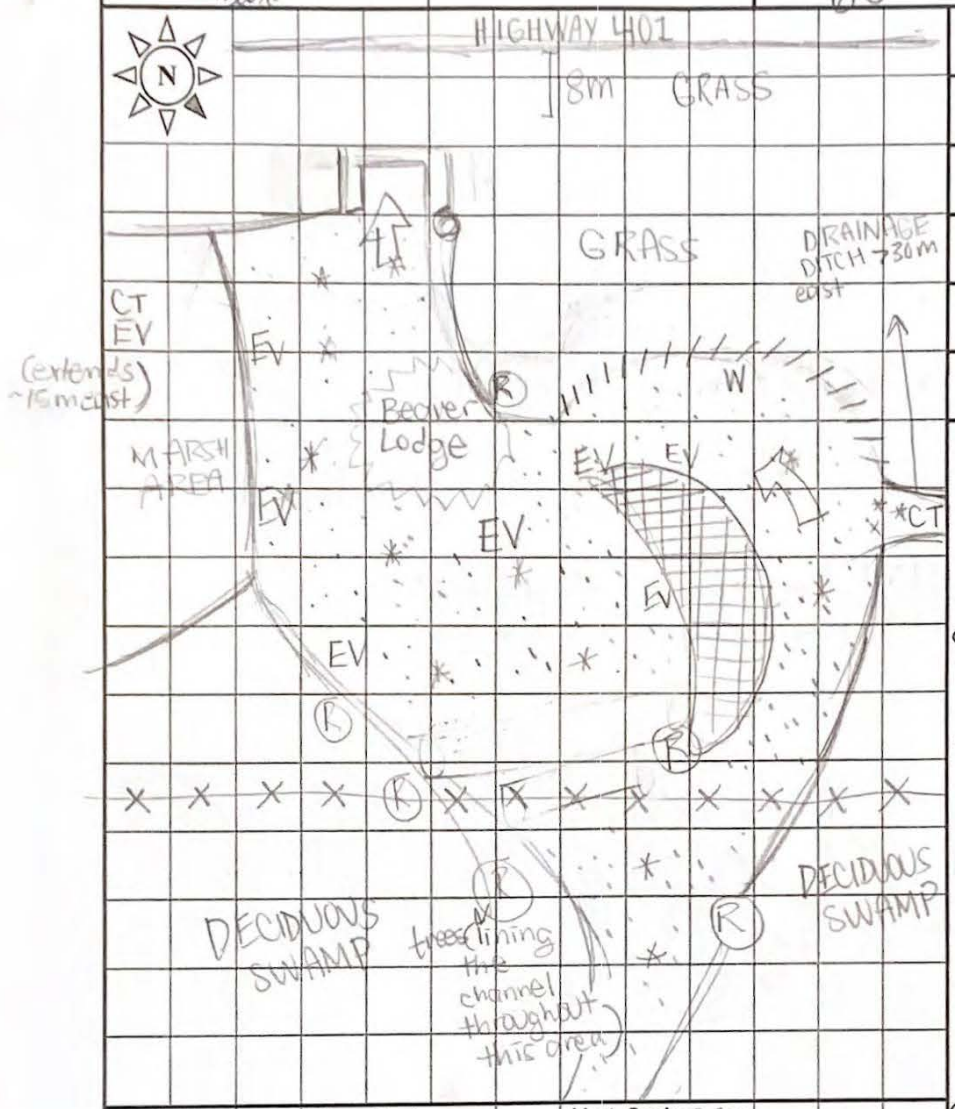
37 WBL

Site: 37

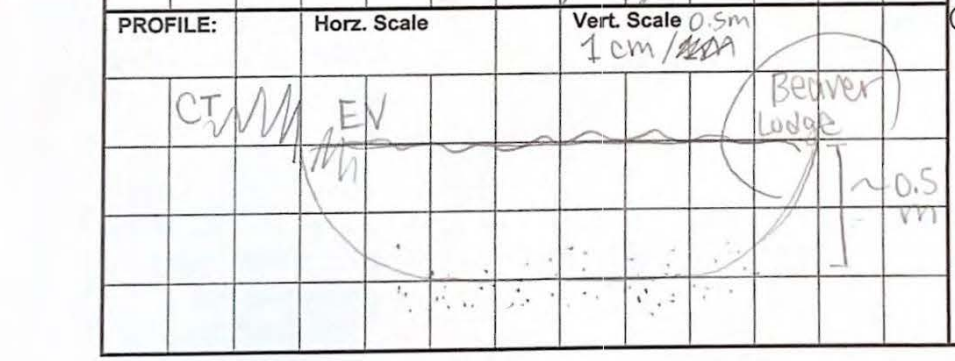
Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Westbound		60	1cm/2m



PROFILE: Horz. Scale — Vert. Scale 0.5m 1 cm / ~~0.5m~~



PROJECT #:	165001323
MAPPER:	MC
NAME OF WATERBODY:	Unknown
CROSSING #:	
STATION #:	10+050
DATE: YY-MMM-DD	24-~~APR~~-30

LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- Island/Bar
- Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submergent/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **///////** Eroded Bank
- **xxx** Riprap/Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- **®** Riparian Tree
- ⊢▶ Seep/Spring
- **--------** Undercut Bank
- **—** Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- Culvert

37 wBL

Site: 37

Ministry of Transportation

Ontario

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # 1655001328				Date: April 30/2024		
Project Description: MTO 401 Mallaytown						
Collectors: Brooks, Chung			Time Started: 1300		Time Finished: 1330	
Weather Conditions: 100% cc			Surface Conditions (If Applicable):			
			Calm ✓	Rippled ○	Wavy ○	Rough ○
LOCATION						
Name of Waterbody: Unknown			Crossing #: 37		Station #:	
Location of Crossing/Station: 4111-22.00						
GPS Coordinates: 18T 448170 4942191			MTO Chainage: 10+050			
Township: Augusta			MNRF District: Kemptville Kingston			

SAMPLING LOCATIONS AND WATER CHEMISTRY

Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream						
Downstream		10.0				
Culvert/Hwy ROW	~~See Map~~		7.85	5.50	10.9	620

Water Colour:

Colourless	Yellow/Brown	Blue/Green	Turbid	Other
✓	○	○	○	○ _____

GEAR		
Electrofisher:		
Length (m): 15	Settings: 50 Hz 150v	Seconds: 150
Nets and Traps:		
Minnow Trap: O #	Dip Net O #	Trap Net O #
Seine: O	Gill O	Other O Specify:
Hauls (#):	Period of Time (24 Hour Clock):	
	Set Time:	Clear Time:
Size of Net:		
Length (m):	Mesh Size:	Depth of Capture:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
Fish Kept? O Yes ⊘ No	Number of Bags	Preservative:			
		Formalin O	Frozen O	Alcohol O	Other (specify) O

ADDITIONAL COMMENTS

4 Brook Sticklebacks

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Site: ET_24+364

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-07-11
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Burnett			Time Started: 09:26	Time Finished:
Weather Conditions: 100% cc, light rain				
Air Temp (°C): 20.0	Dissolved Oxygen (mg/L) 6.37	Water Temp (°C): 19.6	Conductivity (µS/cm): 467.0	Velocity (m/s): Moderate
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Butlers Creek	Drainage System:	Crossing #/ Stantec Station ID: ET_24+364	Station #: 24+364
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.61840889503048, -75.67447073847718		MTO Chainage: 24+364	
Township: Elizabethtown		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous forest	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☑ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Eastbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River,Permanent	
Total Section (Reach) Length (m): 50.0	

Sub-Sections:	☑ Run	☑ Pool	☐ Riffle	☐ Flats	☐ Culvert	☐ Other
Percentage of Area:	60.0	40.0				
Mean wetted depth (m)	0.4	0.5				
Mean wetted width (m)	3.0	5.0				
Mean bankfull depth (m)	0.4	0.5				
Mean bankfull width (m)	3.0	5.0				
Substrate (type & %)	Bo 30 Si 30 Cl 40	Bo 70 Co 5 Cl 25				

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☑	☐	☐
Right Bank	☐	☑	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders: 30.0	Cobbles:	Organic Debris:	None ☐

Vascular Macrophytes: Instream: 10.0 Overhanging: 20.0	Woody Debris: Instream: Overhanging:

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☑	29-1% ☐	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent: 30.0	Floating:	Emergent: 70.0	None ☐
Predominant Species:	Water speedwell		Grasses, soft stem bulrush	

MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal No	None None
POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
At bankfull due to significant rainfall		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

Site: ET_24+364

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-07-11
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Burnett			Time Started: 11:05	Time Finished:
Weather Conditions: 100% cc				
Air Temp (°C): 20.0	Dissolved Oxygen (mg/L) 6.37	Water Temp (°C): 19.6	Conductivity (µS/cm): 467.0	Velocity (m/s): Fast
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Butlers Creek	Drainage System:	Crossing #/ Stantec Station ID: ET_24+364	Station #: 24+364
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.618769708263244, -75.67491708623282		MTO Chainage: 24+364	
Township: Elizabethtown		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous forest	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☐ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Westbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Stream_River,Permanent	
Total Section (Reach) Length (m): 70.0	

Sub-Sections:	☑ Run	☐ Pool	☐ Riffle	☐ Flats	☐ Culvert	☐ Other
Percentage of Area:	100.0					
Mean wetted depth (m)	0.4					
Mean wetted width (m)	2.4					
Mean bankfull depth (m)	0.5					
Mean bankfull width (m)	2.4					
Substrate (type & %)	Bo 30 Co 10 Gr 5 Si 10 Cl 45					

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders: 20.0	Cobbles:	Organic Debris:	None ☐

Vascular Macrophytes: Instream: 1.0 Overhanging: 19.0	Woody Debris: Instream: Overhanging:

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☑	29-1% ☐	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent: 100.0	None ☐
Predominant Species:			Soft stem bulrush, grasses, Joe pye	

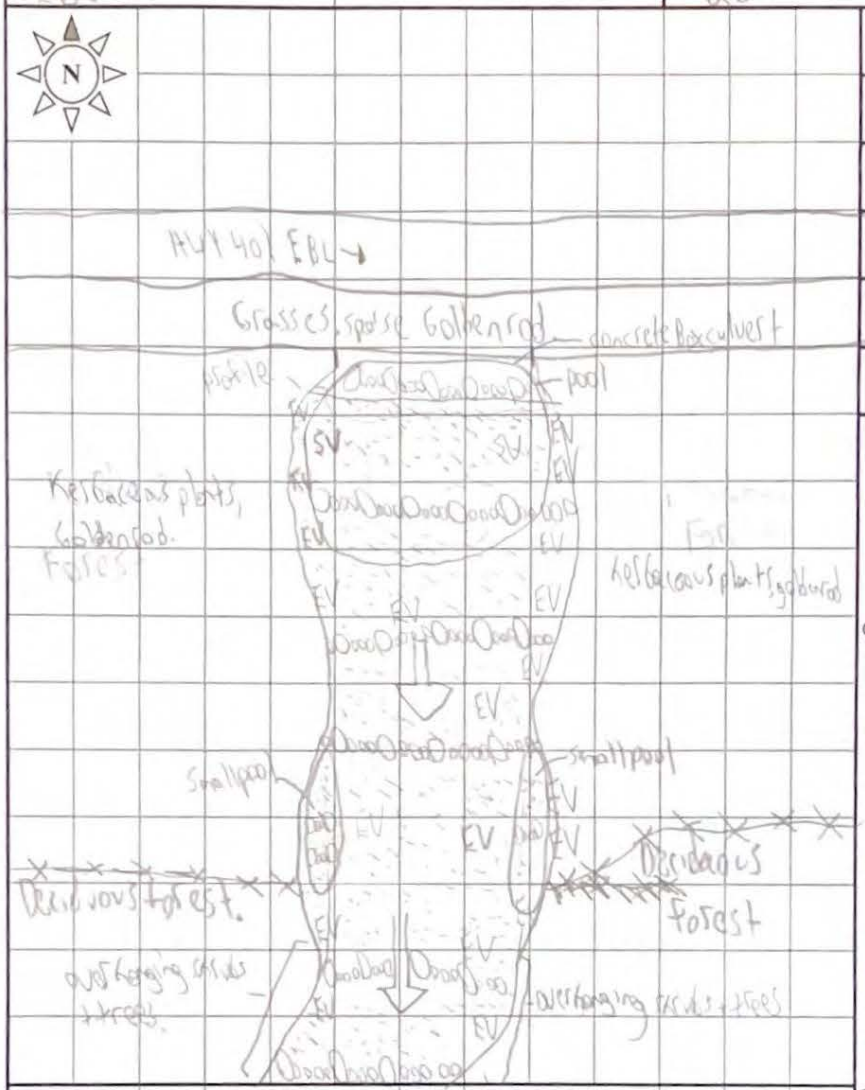
MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal No	None None
POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
Feature near bankfull due to heavy rain. Substrates and fish cover difficult to observe		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

Site: 36

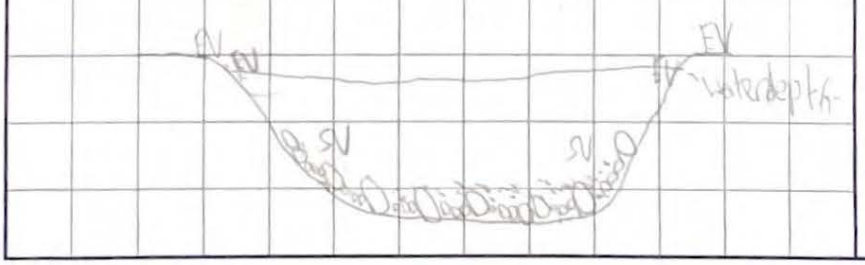
Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
EBL		20	1 cm = 2m



PROFILE: pool at culvert | Horz. Scale: 1cm = 1m | Vert. Scale: 1cm = 20cm



PROJECT #: 16509328

MAPPER: N. Burnett

NAME OF WATERBODY: Butlers Creek

CROSSING #:

STATION #: 24+364

DATE: YY-MMM-DD: 24-JUL-11

LEGEND

10d depth (cm)
6w width

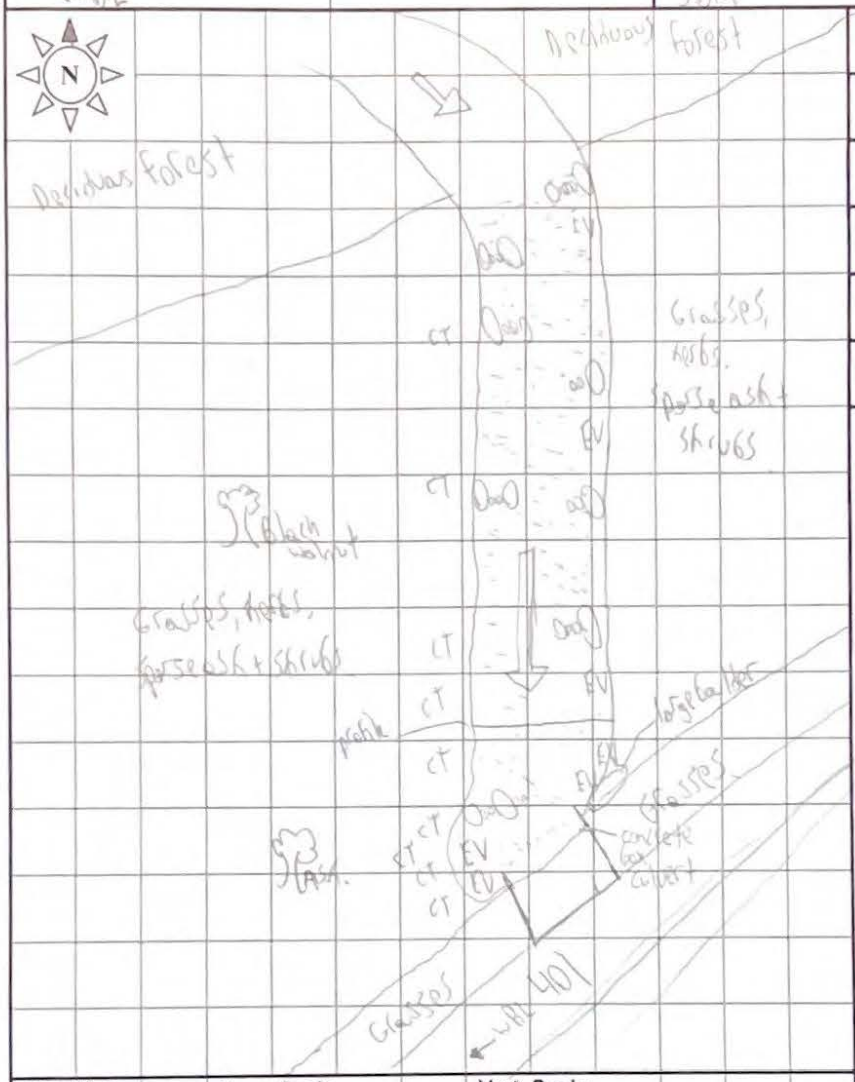
➡ Riffle
⇨ Run/Glide
⬭ Pool
▇ Island/Bar
▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
* * * Debris
CT Cattail
SV/FV Submergent/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
xxx Riprap/Other Stabilization
⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
⊢► Seep/Spring
------- Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
⊔ Culvert

Site: 36

Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
WBL		30m	1cm=3m

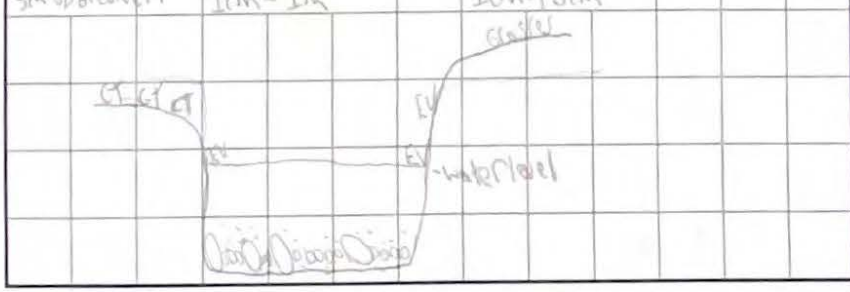


PROJECT #:	1650 01328
MAPPER:	N. Burnett
NAME OF WATERBODY:	Butlers Creek
CROSSING #:	
STATION #:	24+364
DATE: YY-MMM-DD	24-JUL-11

LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- Island/Bar
- Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submergent/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **//////** Eroded Bank
- **xxx** Riprap/Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- ® Riparian Tree
- ├► Seep/Spring
- ------- Undercut Bank
- — Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- └─┘ Culvert

PROFILE:	Horz. Scale	Vert. Scale
5m us of culvert	1cm = 1m	1cm = 10cm



EFSH EBL

Site: 36

Ministry of Transportation

Ontario

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION

Project #	Date:
1650013728	July 11/24

Project Description:

MTO Mallory Avenue

Collectors:	Time Started:	Time Finished:
Brooks, Burnett	1520	1535

Weather Conditions:	Surface Conditions (If Applicable):			
	Calm	Rippled	Wavy	Rough
100% CC	✓	○	○	○

LOCATION

Name of Waterbody:	Crossing #:	Station #:
Butler's Creek		

Location of Crossing/Station:

4111 - 22-00

GPS Coordinates:	MTO Chainage:
18T 446474 4940804	24+364
Township: Elizabethtown	MNRF District: Kemptville Maytag

SAMPLING LOCATIONS AND WATER CHEMISTRY

Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream						
Downstream						
Culvert/Hwy ROW		20	756	6.37	19.6	467

Water Colour:

Colourless	Yellow/Brown	Blue/Green	Turbid	Other
✓	○	○	○	○ _____

GEAR		
Electrofisher:		
Length (m): 15	Settings: 50 Hz, 150 V	Seconds: 162
Nets and Traps:		
Minnow Trap: O #	Dip Net O #	Trap Net O #
Seine: O	Gill O	Other O Specify:
Hauls (#):	Period of Time (24 Hour Clock):	
	Set Time:	Clear Time:
Size of Net:		
Length (m):	Mesh Size:	Depth of Capture:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
Fish Kept? O Yes ✓ No	Number of Bags	Preservative:			
		Formalin O	Frozen O	Alcohol O	Other (specify) O

ADDITIONAL COMMENTS

Johnny / Tesselated Darter E = 7
Brook Stickleback " = 1
Central Mudminnow " = 2
Creek Chub " = 1

Additional Notes Appended? ☒ No ☐ Yes number of pages _____

Site: AG_10+050

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-07-11
Is Stream Realignment required for this section: ☐ Yes ☐ No ☐ Unknown				
Collectors: Brooks, Burnett			Time Started: 09:53	Time Finished:
Weather Conditions: 100% cc				
Air Temp (°C): 20.0	Dissolved Oxygen (mg/L) 6.46	Water Temp (°C): 19.5	Conductivity (µS/cm): 481.0	Velocity (m/s):
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Unknown	Drainage System:	Crossing #/ Stantec Station ID: AG_10+050	Station #: 10+050
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.63115260968326, -75.65337038315175		MTO Chainage: 10+050	
Township: Augusta		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous swamp	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☑ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Eastbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Permanent	
Total Section (Reach) Length (m): 70.0	

Sub-Sections:	☐ Run	☑ Pool	☐ Riffle	☑ Flats	☐ Culvert	☐ Other
Percentage of Area:		20.0		80.0		
Mean wetted depth (m)		0.7		0.6		
Mean wetted width (m)		8.0		7.0		
Mean bankfull depth (m)		0.7		0.6		
Mean bankfull width (m)				7.0		
Substrate (type & %)		Si 60 Cl 20 Mu 20		Si 70 Cl 10 Mu 10 D 10		

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris: 10.0	None ☐

Vascular Macrophytes: Instream: 50.0 Overhanging: 10.0	Woody Debris: Instream: 15.0 Overhanging: 5.0

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☑	59-30% ☐	29-1% ☐	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent: 100.0	None ☐
Predominant Species:			Grasses, floating leaved pondweed	

MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal Yes Beaver dam at edge of ROw	None
POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
Beaver dam impoundment with significant flooding due to recent rain. Watercourse primarily in flood condition with some areas at bankfull. Additionally recieves inputs from ditchline to west with no barriers to fish passage for ~40m from culvert		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

Site: AG_10+050

Ministry of Transportation

Ontario

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 165001328		Project Description: Highway 401 East of Brockville		Date (yyyy-mm-dd): 2024-07-11
Is Stream Realignment required for this section: ☐ Yes ☐ No ☑ Unknown				
Collectors: Brooks, Burnett			Time Started: 10:36	Time Finished:
Weather Conditions: 100% cc				
Air Temp (°C): 20.0	Dissolved Oxygen (mg/L) 6.46	Water Temp (°C): 19.5	Conductivity (µS/cm): 481.0	Velocity (m/s): Near stagnant
Photos Numbers And Descriptions:				

LOCATION			
Name of Waterbody: Unknown	Drainage System:	Crossing #/ Stantec Station ID: AG_10+050	Station #: 10+050
Location Of Crossing: 4111-22-00			
GPS Coordinates: 44.63146646493285, -75.65408603060472		MTO Chainage: 10+050	
Township: Augusta		MNRF District: Kemptville Kingston	

LAND USE AND POLLUTION	
Surrounding Land Use: 401, deciduous swamp	Sources of Pollution: 401
EXISTING STRUCTURE TYPE	
☐ Bridge ☐ Box Culvert ☐ Open Foot Culvert ☐ CSP ☐ N/A ☐ Other	
☐ Other (Describe)	Size: (w x h) m^2
SECTION TYPE AND MORPHOLOGY	
Section (Reach) Identifier: Westbound	Section Location: (Include On Habitat Map)
Associated Wetland	
Reach Type: Permanent	
Total Section (Reach) Length (m): 70.0	

Sub-Sections:	☐ Run	☐ Pool	☐ Riffle	☐ Flats	☐ Culvert	☑ OtherImpoundmentImpoundment and flooding
Percentage of Area:						100.0
Mean wetted depth (m)						0.6
Mean wetted width (m)						20+
Mean bankfull depth (m)						Undefined
Mean bankfull width (m)						Undefined
Substrate (type & %)						Si70 Mu20 D10

Bedrock (Br)	***Boulder (Bo)***	***Cobble (Co)***	***Gravel (Gr)***	***Sand (Sa)***	***Silt (Si)***	***Clay (Cl)***	***Muck (Mu)***	***Detritus (D)***

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☐	☐	☑	☐
Right Bank	☐	☐	☑	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☑	☐	☐	☐
Right Bank	☐	☐	☑	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris: 20.0	None ☐

Vascular Macrophytes: Instream: 10.0 Overhanging: 5.0	Woody Debris: Instream: 20.0 Overhanging: 40.0

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☑	59-30% ☐	29-1% ☐	None ☐

Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent: 100.0	None ☐
Predominant Species:			Grasses, typha	

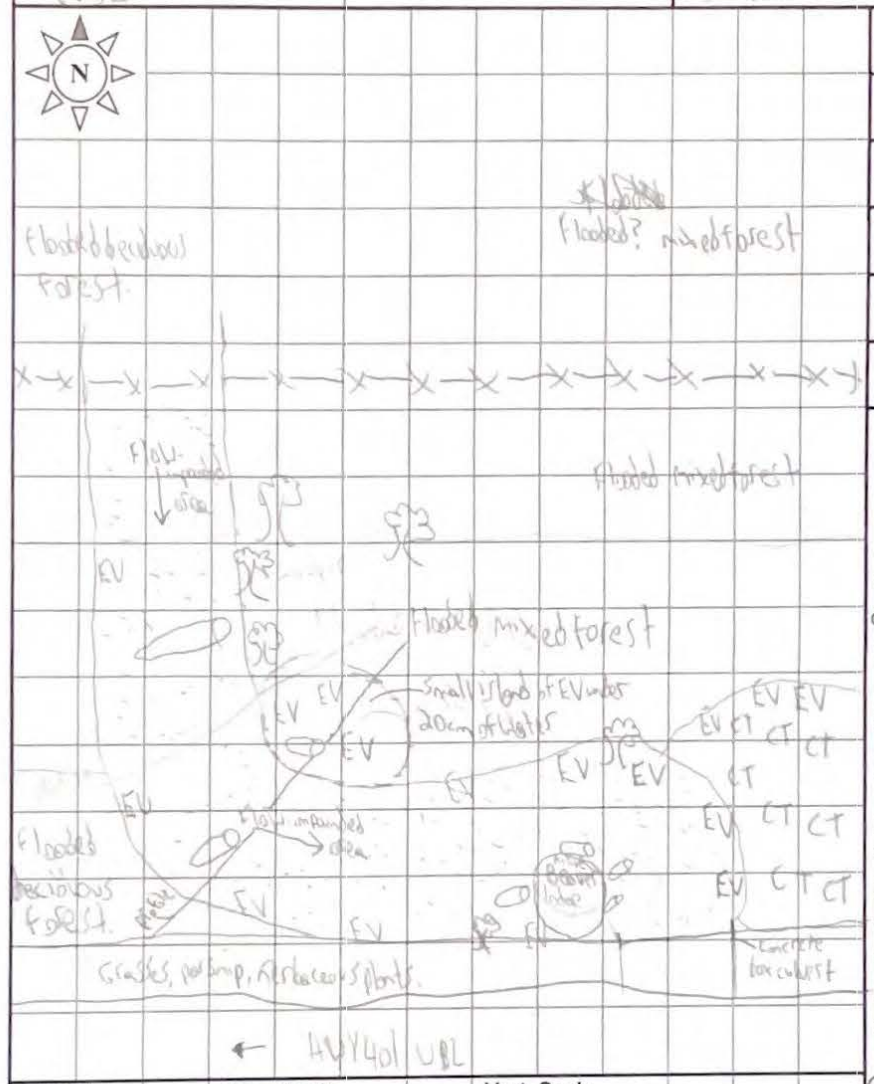
MIGRATORY OBSTRUCTIONS		
Permanent No	Seasonal No	None None
POTENTIAL CRITICAL HABITAT		
Spawning No	Groundwater No	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
ADDITIONAL COMMENTS		
Large impoundment due to DS beaver dam, at least 20m of forest flooded outside of ROW. Beaver hut at culvert. Water levels near top of culvert inlet. Former channel still visible, likely run habitat with pool at culvert		
Additional Notes Appended? ○ No ○ Yes		Number of Pages _____

Site: 37

Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
WBL		30 m	1 = 3m



PROJECT #: 1650 01328

MAPPER: N. Burnett

NAME OF WATERBODY: Unknown

CROSSING #:

STATION #: 101050

DATE: YY-MMM-DD 24-JUL-11

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▇ Island/Bar
▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
* * * Debris

CT Cattail
SV/FV Submergent/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
xxx Riprap/Other Stabilization
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree

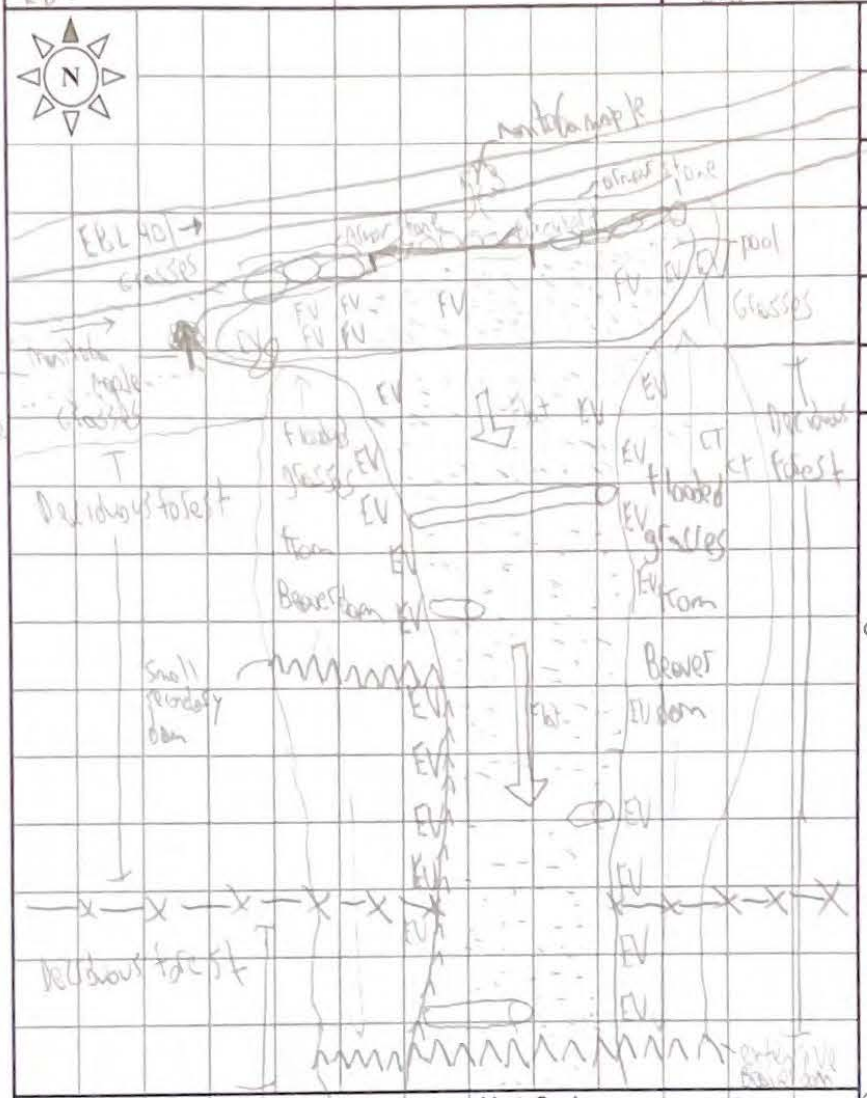
├► Seep/Spring
------ Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
└┘ Culvert

Site: 37

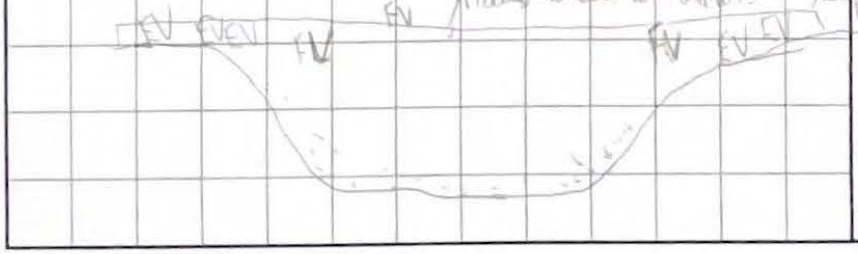
Ministry of Transportation

Ontario

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
EBL		20	1cm=2m



PROFILE:	Horz. Scale	Vert. Scale
5m Culvert	1cm=1m	1cm=20cm



PROJECT #: 16500132

MAPPER: N Burnett

NAME OF WATERBODY: Unknown

CROSSING #:

STATION #: 101050

DATE: YY-MMM-DD 24-JUL-11

LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▮ Island/Bar
- ▒ Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submergent/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **////////** Eroded Bank
- **xxx** Riprap/Other Stabilization
- ⬭ Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- ⊢► Seep/Spring
- ——— Undercut Bank
- — Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- ⌴ Culvert

E fish EBL

Site: 37

Ministry of Transportation

Ontario

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION				
Project # 16500328		Date: July 11/24		
Project Description: MTO Millington				
Collectors: Brook, Burnett	Time Started: 1545	Time Finished: 1600		
Weather Conditions:	Surface Conditions (If Applicable):			
	Calm ○	Rippled ○	Wavy ○	Rough ○

LOCATION		
Name of Waterbody: Unknown	Crossing #:	Station #:
Location of Crossing/Station: 4111 - 22.00		
GPS Coordinates: 18T - 448170 4947191	MTO Chainage: 10+050	
Township: Augusta	MNRF District: Kemptville Kingston	

SAMPLING LOCATIONS AND WATER CHEMISTRY

Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream						
Downstream						
Culvert/Hwy ROW		20	7.57	6.46	19.5	481

Water Colour:

Colourless ○	Yellow/Brown ○	Blue/Green ○	Turbid ○	Other ○ Tannins

GEAR		
Electrofisher:		
Length (m): 15	Settings: 50 Hz, 150v	Seconds: ~~243~~ 243
Nets and Traps:		
Minnow Trap: O #	Dip Net O #	Trap Net O #
Seine: O	Gill O	Other O Specify:
Hauls (#):	Period of Time (24 Hour Clock):	
	Set Time:	Clear Time:
Size of Net:		
Length (m):	Mesh Size:	Depth of Capture:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
Fish Kept? O Yes ⊘ No	Number of Bags	Preservative:			
		Formalin O	Frozen O	Alcohol O	Other (specify) O

ADDITIONAL COMMENTS

Central Mudminnow : = 2

Brook Stickleback : = 2

Additional Notes Appended? ☒ No ☐ Yes number of pages _____

Appendix D:
Photographic Record

Photo 1: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Eastbound, culvert outlet facing north

Photo 2: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Eastbound, erosion on west bank facing west

Photo 3: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Eastbound, facing south (downstream)

Photo 4: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Eastbound, substrate

Photo 5: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Westbound, culvert inlet facing southwest

Photo 6: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Westbound, facing north (upstream)

Photo 7: Site WC36; Station ET_24+364 (Elizabethtown) - Butler's Creek; Highway 401 Westbound, substrate

Photo 8: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, culvert outlet facing northeast

Photo 9: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, facing beaver dam to southeast

Photo 10: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, facing southeast (downstream)

Photo 11: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, watercress and substrate

Photo 12: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, facing southwest towards drainage ditch

Photo 13: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, confluence with drainage ditch facing northeast (downstream)

Photo 14: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Eastbound, drainage ditch to southwest, facing southwest (upstream)

Photo 15: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, facing northwest (upstream)

Photo 16: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, culvert inlet facing southeast

Photo 17: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, impounded area facing northwest

Photo 18: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, facing northwest (downstream)

Photo 19: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, drainage ditch to southwest, facing southwest (upstream)

Photo 20: Site WC37; Station AG_10+050 (Augusta) - Unnamed Tributary to St. Lawrence; Highway 401 Westbound, confluence with drainage ditch facing northeast (downstream)

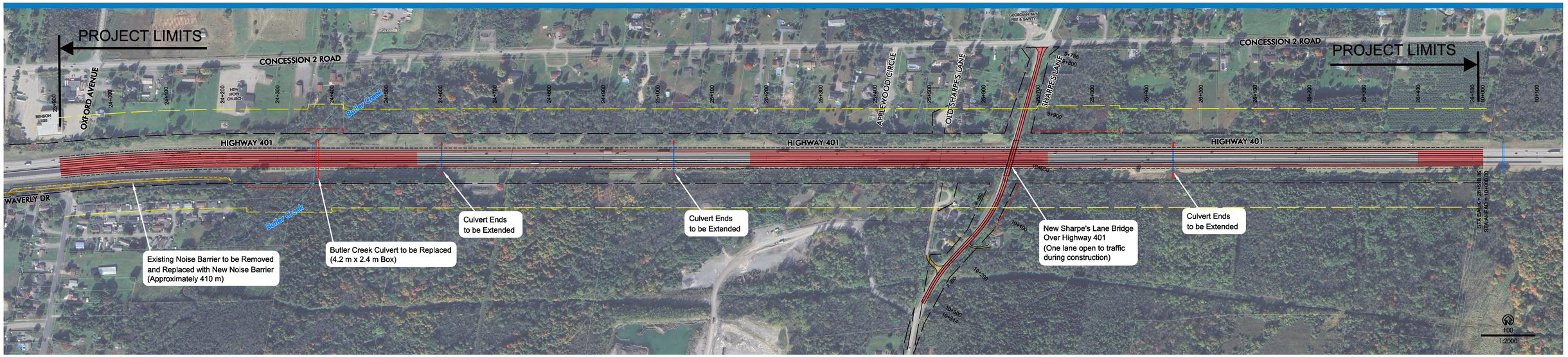
Appendix E:
Recommended / Preferred Plan

Highway 401 Technically Preferred Plan

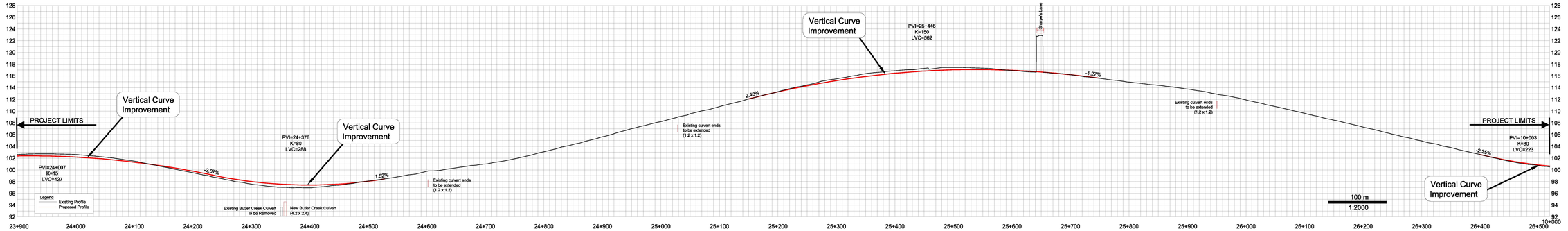
Study Area Improvement Plan

LEGEND

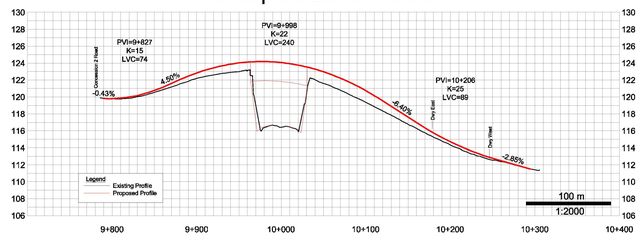
- Limit of existing MTO right of way
- New Roadway - Initial (6-Lane Highway 401)
- New Roadway - Ultimate (8-Lane Highway 401)
- Property Required - Ultimate (8-Lane Highway 401)
- Designation Limits
- Proposed Grading Limits - Ultimate (8-Lane Highway 401)
- Driveway Modification
- Existing Culvert
- New Culvert / Extension
- Existing Noise Barrier Wall to be Removed
- New Noise Barrier Wall
- OBH — Overhead Bell and Hydro
- OH — Overhead Hydro
- UB — Undergound Bell (FOTS)



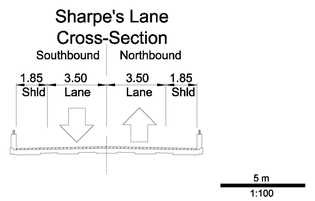
Highway 401 Profile

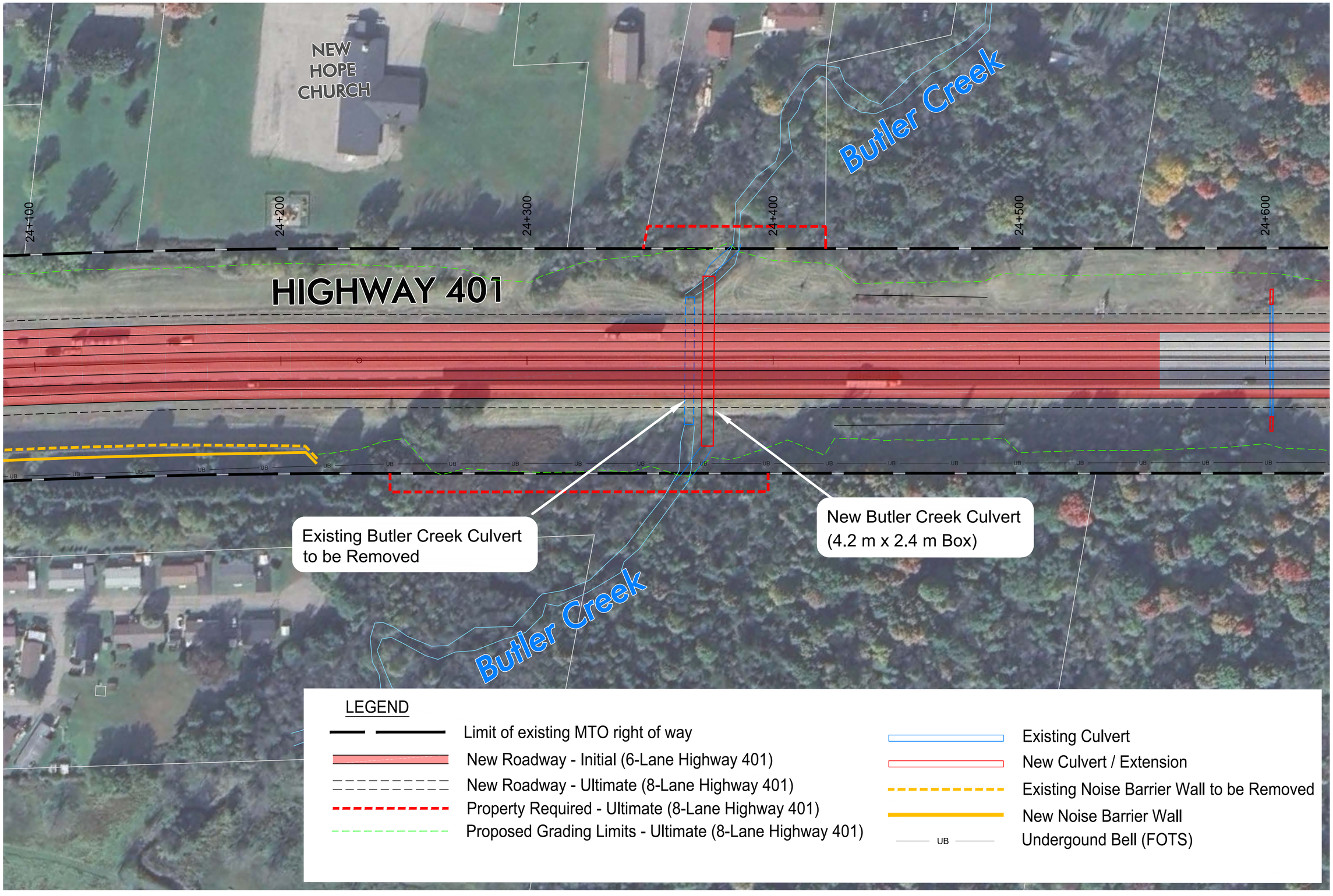


Sharpe's Lane Profile



Sharpe's Lane Cross-Section




NEW
HOPE
CHURCH
Butler Creek
24+100
24+200
24+300
24+400
24+500
24+600
HIGHWAY 401
Existing Butler Creek Culvert
to be Removed
New Butler Creek Culvert
(4.2 m x 2.4 m Box)
Butler Creek
LEGEND
Limit of existing MTO right of way
New Roadway - Initial (6-Lane Highway 401)
New Roadway - Ultimate (8-Lane Highway 401)
Property Required - Ultimate (8-Lane Highway 401)
Proposed Grading Limits - Ultimate (8-Lane Highway 401)
Existing Culvert
New Culvert / Extension
Existing Noise Barrier Wall to be Removed
New Noise Barrier Wall
UB
Undergound Bell (FOTS)