MUNICIPAL CLASS ENVIRONMENTAL ASSESMSENT
MCEA PROJECT FILE REPORT - DRAFT

Schedule "B" Municipal Class Environmental Assessment Study, Bridge (C001) on Route 800 over Butternut Creek, Nation Municipality, Ontario.

MP Project No.: 0CM-19-0127

Prepared for:

The Nation Municipality
3248 County Road 9
Fournier, Ontario K0B 1G0

Prepared by:

McINTOSH PERRY

McIntosh Perry Consulting Engineers
115 Walgreen Road
Carp, ON K0A 1L0

PROJECT FILE REPORT - DRAFT
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Draft
September 13, 2022

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Lisa Marshall
Project Manager
McIntosh Perry Consulting Engineers Ltd.

McINTOSH PERRY

September 13, 2022
MP Project No.: 0CM-19-0127

The Nation Municipality
3248 County Road 9
Fournier, Ontario K0B 1G0

Attention: Marc Legault, P. Eng., Director of Public Works

RE: Project File Report: Schedule "B" Municipal Class Environmental Assessment Study, Bridge C001 on Route 800 over Butternut Creek, Nation Municipality, Ontario.

Dear Mr. Legault,

McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) is pleased to submit this Draft Project File Report for the Schedule "B" Municipal Class Environmental Assessment to the Nation Municipality.

This Project File Report provides a comprehensive review of the various solutions, the evaluation criteria, and the final recommendation for the technically preferred solution for Bridge C001 on Route 800 over Butternut Creek. Our team has conducted an in-depth review of the study area, bridge conditions, servicing needs, and stakeholder/public requirements. In particular, this report is intended to:

- Provide a background to the study;
- Define the nature and extent of the problem or opportunity, and explain the source of the concern or issue and the need for a solution;
- Outline the existing structural engineering and environmental (natural, social, cultural) conditions within the study area;
- Provide the alternative solutions considered;
- Provide evaluation followed and selection of the technically preferred solution;
- Define follow-up commitments, and
- Summarize the public consultation program employed.

If you have any questions or require any additional information, please contact the undersigned.

Sincerely,

Lisa Marshall, P.Eng.
McIntosh Perry Consulting Engineers Ltd.
Project Manager

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1.0 INTRODUCTION

The Nation Municipality (the Municipality) retained McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) to provide consulting services to complete a Municipal Class Environmental Assessment (EA) for an existing Bridge (C001) on Route 800 East. The project is following the requirements of the Municipal Class EA process for a Schedule "B" undertaking approved under the *Ontario Environmental Assessment Act*, in order to identify and develop a technically preferred solution for addressing concerns related to Bridge C001 on Route 800 over Butternut Creek in the Nation Municipality.

The existing Bridge C001 that spans Butternut Creek on Route 800 East has reached the end of its service life. The Municipality is considering various alternative solutions, one of which is to close Route 800 at the bridge and construct a new road alignment to by-pass the creek on the north-east side refer to **Figure 1**.

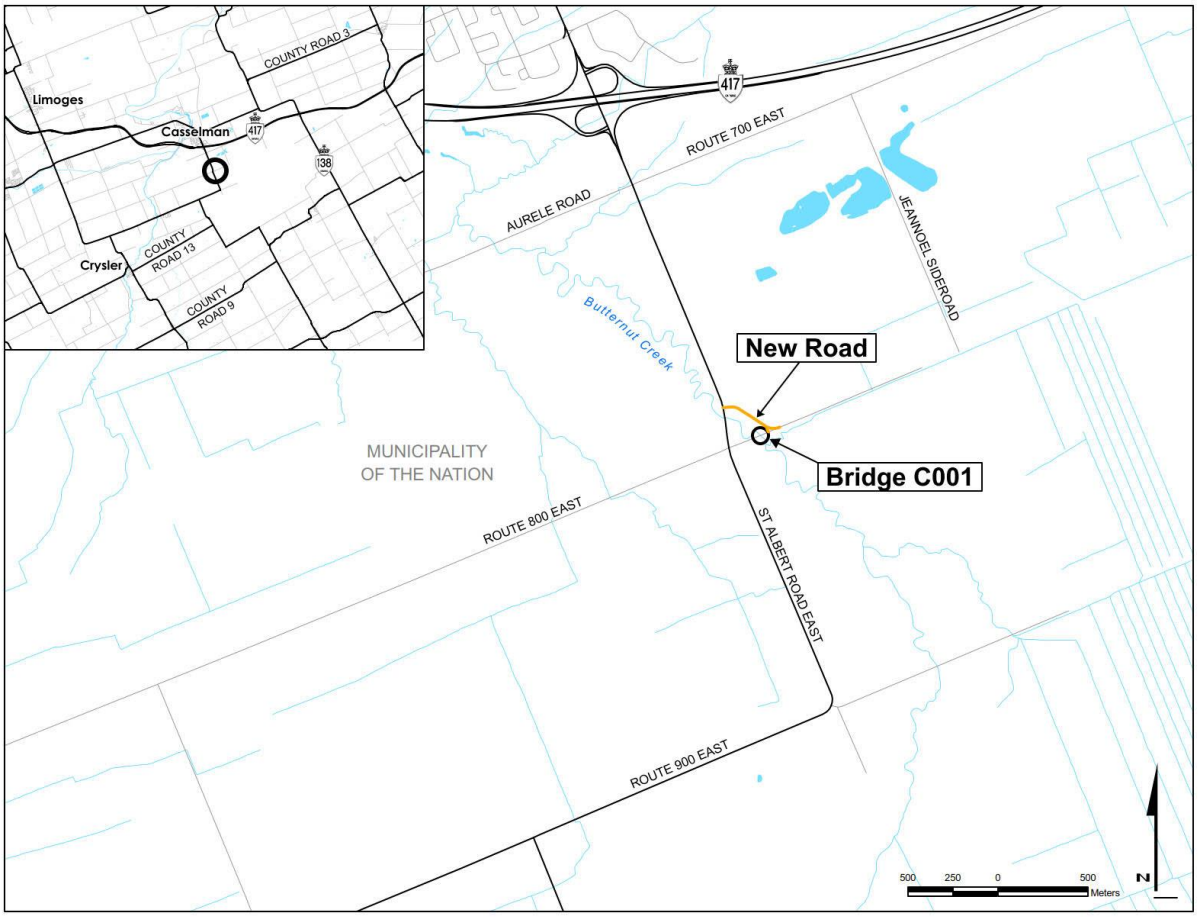

Figure 1: Bridge C001 on Route 800 Study Area Key Map

2.0 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Ontario's Environmental Assessment Act

Ontario's Environmental Assessment Act (EAA) was passed in 1975 and was proclaimed in 1976. The EAA requires proponents to examine and document the environmental effects that could result from major projects or activities and their alternatives. Municipal undertakings became subject to the EAA in 1981. The EAA's comprehensive definition of the environment is:

- Air, land or water;
- Plant and animal life, including human life;
- The social, economic and cultural conditions that influence the life of humans or community;
- Any building, structure, machine or other device or thing made by humans;
- Any solid, liquid, gas, odour, heat, sound, vibration, or radiation resulting directly or indirectly from human activities, and
- Any part of a combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

The purpose of the EAA is the betterment of the people as a whole, or any part of Ontario by providing for the protection, conservation and wise management of the environment in Ontario (RSO 1990, c.18, s.2). It is the objective of the EAA proponents to ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process.

To meet the requirements of Ontario's EAA, class environmental assessments were approved by the Minister of the Environment in 1987 as a means of obtaining project-specific approval under the Ontario EAA. The Class EA approach streamlines the planning and approvals process for projects that are:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable in the range of environmental impacts, and
- Responsive to mitigation.

2.2 Class Environmental Assessment Process

The MCEA, prepared by the Municipal Engineers Association (MEA) (October 2000, amended 2011, 2015 and 2017) outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. The MCEA process provides municipalities with a five-phase planning procedure approved under the EAA for proponents to follow to meet Ontario's EA requirements.

- **Phase 1:** Problem or Opportunity Statement
- **Phase 2:** Identification and Evaluation of Alternative Solutions
- **Phase 3:** Examination of Alternative Methods

- **Phase 4:** Documentation of the Class EA Process
- **Phase 5:** Implementation and Monitoring.

Projects subject to the Class EA process are classified into the following four "Schedules" based on the degree of the expected impacts.

- **Schedule "A":** Projects are limited in scale, have minimal adverse effects and include the majority of municipal maintenance and operational activities. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases.
- **Schedule "A+":** Projects are limited in scale and have minimal adverse effects. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases. However, the public is to be advised prior to project implementation, though there is no ability for the public to request a Part II Order.
- **Schedule "B":** Projects have the potential for some adverse environmental effects. The municipality is required to undertake a screening process (Phases 1 and 2) involving mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are being addressed. Schedule "B" project require that a Project File report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation. However, a request may be made to the Ministry of Environment, Conservation and Parks for an order requiring a higher level of study, or that conditions may be imposed, only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Request on other grounds will not be considered.
- **Schedule "C":** Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the MCEA Document (Phases 1 to 4). Schedule "C" projects require that an Environmental Study Report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation.

Figure 2 illustrates the MCEA planning and design process with the phases required for each schedule.

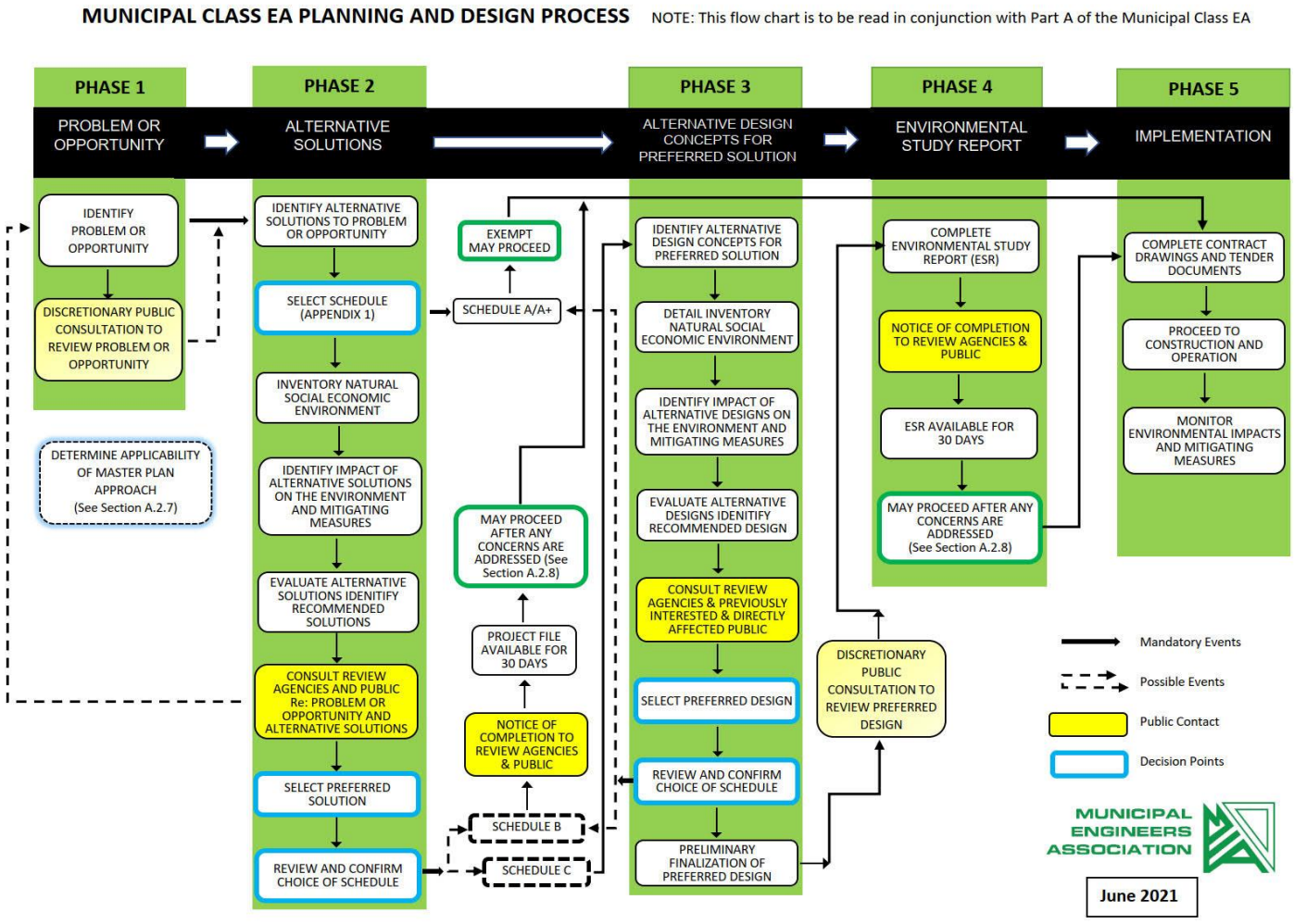

Figure 2: Municipal Class EA Planning and Design Process

2.2.1 Schedule B Classification

The Bridge C001 on Route 800 study is designated as a Schedule "B" undertaking according to the Municipal Class EA (October 2000, amended 2011, 2015 and 2017). A Schedule "B" undertaking must fulfill the first two phases of the MCEA process before moving on to the detail design and implementation. The MCEA planning phases undertaken for this study are listed below.

Phase 1: Identify the Problem / Opportunity
This phase involves not only identifying the problem/opportunity, but also describing it in sufficient detail to formulate a clear problem/opportunity statement. It is important that this statement is concise and considers the goals and objectives of the MCEA, as it is used to dictate the scope of the project.

Phase 2: Identify and Evaluate Alternative Solutions to the Problem/Opportunity
This phase involves undertaking the following six steps:

- Identify reasonable alternative solutions to the problem/opportunity;
- Prepare a general inventory of the existing natural, social and economic environments in which the project is to occur;
- Identify the net positive and negative effects of each alternative solution including mitigating measures, where possible;
- Evaluate the alternative solutions and identify a technically preferred solution;
- Consult with review agencies and the public to solicit comments and input; and
- Select/confirm the technically preferred solution.

2.2.1.1 Mandatory Principles

The planning process followed not only adheres to the guidelines outlined by the MCEA document, but reflects the following five mandatory principles of MCEA planning under the EAA:

- Consultation with affected parties early on and throughout the process, such that the planning process is a cooperative venture;
- Consideration of a reasonable range of alternatives, both functionally different alternative to the project (known as alternative solutions) and alternative methods of implementing the preferred solution;
- Identification and consideration of the effects of each alternative on all aspects of the environment;
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and
- Provision of clear and complete documentation of the planning process followed to allow 'traceability' of decision-making with respect to the project.

Following these five principles ensures that the MCEA process is devoted to the prevention of problems and environmental damage through planning and decision-making, recognizing that research and evaluation of possible impacts have been considered prior to implementation of the project.

2.2.2 Impact Assessment Act

On August 28, 2019, the Impact Assessment Act (IAA) replaced the former *Canadian Environmental Assessment Act* (CEEA), 2012. The projects and activities that are subject to the IAA are very similar to those that were subject to an environmental assessment under the CEAA, 2012. However, some changes have been made to the "Project List", such as new thresholds or projects have been introduced or increased. Under the IAA, only those projects designated by the Physical Activities Regulations or designated by the Minister of Environment on a discretionary basis may be subject to federal environmental assessment.

It has been determined that this project does not include physical activities identified on the list and is therefore not subject to the IAA process.

3.0 STUDY OVERVIEW

Phase 1 of the MCEA study required a clear and concise Problem/Opportunity Statement, followed by Phase 2 Alternative Solutions considered to address the identified Problem/Opportunity. At this point in the study, the details of the Alternative Solutions are considered 'preliminary' until a Preferred Solution is adopted by the Municipality to carry forward into detail design.

3.1 Phase 1 – Problem/Opportunity Statement

The existing Bridge C001 is located on Route 800 East and 0.2 km east of St. Albert Street and runs in an east-west direction. The bridge was built in 1951 and is a concrete slab on steel girder structure with a length of 8.0 m and a width of 5.0 m. Bridge C001 is nearing the end of its service life. Therefore, the Nation Municipality has the opportunity to identify and evaluate alternative solutions and determine a preferred solution in accordance with the Municipal Class Environmental Process.

3.2 Phase 2 – Alternative Solutions

To address the Problem/Opportunity Statement the following four (4) Alternative Solutions were developed:

- **Alternative 1:** Do nothing
- **Alternative 2:** Rehabilitate the existing Bridge C001.
- **Alternative 3:** Replace existing Bridge C001 with new Structure.
- **Alternative 4:** Decommission the existing Bridge C001 and construction of a new road alignment for Route 800.

3.2.1 Alternative 1 - Do nothing

Alternative 1 involves leaving the existing Bridge C001 in place, in its deteriorating condition. Continued inaction on the deteriorating conditions of Bridge C001 will amount to demolition by neglect which would pose as a health and safety concern. Therefore, Alternative 1 is not considered to be a viable option, however, this option has been carried forward for evaluation to use as a benchmark for the other Alternative Design Concepts.

3.2.2 Alternative 2 - Rehabilitate the Existing Bridge C001

Alternative 2 involves the rehabilitation of the existing Bridge C001. This alternative would attempt to extend the service of the structure by 10-15 years. A temporary bailey bridge would need to be installed on private property adjacent to the existing structure to detour traffic as the existing structure is not wide enough to accommodate staged construction for the rehabilitation. This alternative would require temporary limited interest on private property to construct the detour road and bailey bridge.

3.2.3 Alternative 3 - Replace Existing Bridge C001 with new Structure

Alternative 3 involves the complete removal and replacement of the existing Bridge C001 in the current location. The new structure will have a life span of 75 years. The intention is to provide a structure that meets operational and safety standards. A temporary bailey bridge would need to be installed on private property to detour traffic to

facilitate the demolition of the old bridge and construction of the new structure. This alternative would require temporary limited interest on private property to construct the detour road and bailey bridge.

3.2.4 Alternative 4 - Decommission the existing Bridge C001 and Construction of a new Road Alignment

Alternative 4 includes decommissioning the existing Bridge C001 and constructing a new road alignment to by-pass the creek on the north-east side, as well as construction of new turnaround areas at the east and west ends of the bridge on Route 800. This alternative would include permanent property acquisition.

4.0 INVENTORY OF EXISTING CONDITIONS

This section presents an overview of the background information (secondary source information) and the results of the field inventories undertaken specifically for this study. The following sections provide a summary of the existing natural, socio-economic, and cultural environments, as well as the structural conditions of the existing Bridge C001.

4.1 Natural Environmental Conditions

Determining the existing natural environmental conditions of the study area is required to assess the potential impacts of each alternative option considered as part of this MCEA study.

A desktop review was undertaken to collect background data and document all known natural features within the study area, prior to undertaking field work. Information was obtained from the following sources during the desktop review:

- Wildlife atlases for birds and herpetofauna, (Bird Studies Canada et al. 2006, Ontario Nature, 2019,);
- Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) database;
- MNRF Make a Map: Natural Heritage Areas mapping application;
- DFO Aquatic Species at Risk Mapping Tool;
- Fish On-line resource (MNRF);
- The Ontario Butterfly Atlas (OBA) (Toronto Entomologists' Association, 2020);
- South Nation Conservation Authority, and
- United Counties of Prescott & Russell Official Plan.

Field investigations were conducted on May 26, 2021 to collect current, and site-specific information related to terrestrial and aquatic ecosystems within the study area by McIntosh Perry. Field investigation included identification od the following where applicable:

- Existing vegetation communities;
- Existing fish habitat;
- Species at Risk (SAR) and their habitat;
- Resident or migrant bird and wildlife species;
- Critical habitat areas, and
- Existing land uses surrounding the study area.

For detailed information obtained through McIntosh Perry's desktop review and field investigations at the Bridge C001 study area, please refer to the Summary of Existing Environmental Conditions Memo (**Appendix A**). The following sections summarize the natural environmental conditions of the study area.

4.1.1 Vegetation

The study area is located within the Lake Simcoe-Rideau Ontario Ecoregion (Ecoregion 6E), of the Mixedwood Plains Ecozone within the Great Lakes-St. Lawrence Forest Region (Crins et al., 2009). The region is largely comprised of

cropland (57%), pastures (44.4%), and abandoned fields (12.8%). Forested areas of the Lake Simcoe-Rideau Ecoregion are composed primarily of deciduous forest (16%) with some additional coniferous and mixed forests. Typical tree species include green ash (*Fraxinus pennsylvanica*), silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), eastern white cedar (*Thuja occidentalis*), yellow birch (*Betula alleghaniensis*) balsam fir (*Abies balsamea*), black ash (Fraxinus nigra), black spruce (*Picea mariana*), tamarack (*Larix laricina*) and numerous other species (Crins et al., 2009).

The study area is dominated by agricultural land with rural residential properties and a few commercial businesses. Vegetation communities within the study area include an agricultural field, Dry-Fresh Graminoid Meadow (MEGM3), Dry-Fresh Deciduous Woodland (WODM4), and Dry-Fresh White Ash Decidous Woodlot (WODM4-1). No species at risk (SAR) or rare vegetation was identified during the field investigation.

The following species classified as '*noxious weeds'* under the *Weed Control Act*, 1900 were observed within the study area during the 2021 fied investigation:

- bull thistle (*Cirsium vulgare*);
- coltsfoot (*Tussilago farfara*);
- common buckthorn (*Rhamnus cathartica*);
- gaint ragweed (*Ambrosia trifida* L.), and
- wild parsnip (*Pastinaca sativa*).

4.1.2 Wetland Habitat

There are no Provincially Significant Wetlands (PSW) located within the study area. The Moose Creek wetland (evaluated – other) is located approximately 2 km east of the study area.

SNC Online Mapping Portal identifies a wetland as evaluated-other within the study area associated with Butternut Creek upstream of Bridge C001.

LEGEND

- Bridge Location
- Study Area
- Active Eastern Phoebe Nest
- Active Rock Pigeon Nest
- Barn Swallows Aerially Foraging
- Eastern Meadowlark (heard)
- Unevaluated Wetland
- Watercourse

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2021.

40 20 0 40

Scale 1:1,500 Metres

CLIENT: THE NATION MUNICIPALITY

PROJECT: BRIDGE C001 AND ROUTE 800 ROAD ALIGNMENT

TITLE: CONSTRAINTS OPPORTUNITIES

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO: CM-19-0127		FIGURE: 3
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4.1.3 Wildlife

Characteristic wildlife of the area includes: white-tailed deer (Odocoileus virginianus), northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mepthitis*), woodchuck (*Marmota monax*), Red-spotted Newt (*Notophthalmus viridescens*), Snapping Turtle (*Chelydra serpentina*), Eastern garter snake (*Thamnophis sirtalis sirtalis*) and common watersnake (*Nerodia sipedon*). Representative bird species include Field Sparrow (*Spizella pusilla*), Grasshopper Sparrow (*Ammodramus savnnarum*), and Eastern Meadowlark (*Sturnella magna*) (Crins et al., 2009).

During the 2021 field investigation, the following wildlife were observed: Eastern chipmunk (*Tamias striatus*), least weasel (*Mustela nivalis*) and Northern leopard frog (*Lithobates pipiens*).

During the 2021 field investigation, the following migratory bird species were observed: American Crow (*Corvus brachurhynchos*), American Goldfinch (*Spinus tristis*), American Robin (*Turdus migratorius*), Baltimore Oriole (*Icterus glabula*), Barn Swallow (*Hurundo rustica*), Belted Kingfisher (*Megaceryle alcyon*), Blue Jay (*Cyanocitta cristata*), Brown-headed Cowbird (*Molothrus ater*), Chestnut-sided Warbler (*Setophaga pensylvanica*), Chipping Sparrow (*Spizella passerine*), Common Crackle (*Quiscalus quiscula*), Eastern Meadowlark (*Sturnella magna*), Eastern Phoebe (*Sayornis phoebe*), European Starling (*Sturnus vulgaris*), Killdeer (*Charadrius vociferus*), Mourning Dove (*Zenaida macroura*), Northern Cardinal (*Cardinalis cardinalis*), Red-winged Blackbird (Agelaius phoeniceus), Red-eyed Vireo (*Vireo olivaceus*), Rock Dove (*Columba livia*), Song Sparrow (*Melospiza melodia*), Spotted Sandpiper (*Actitis macularius*), Tree Sswallow (*Tachycineta bicolor*), Turkey Vulture (*Catharetes aura),* Warbling Vireo (*Vireo gilvus*), and Yellow Warbler (*Setophaga petechia*).

An active Eastern phoebe nest was observed within the St. Albert Road culvert and active Eastern phoebe and Rock pigeon nests were observed on the existing Bridge C001 during the natural science field investigation.

4.1.4 Fisheries and Aquatic Ecosystems

The watercourse associated with the Bridge C001 study area is Butternut Creek, which drains into the South Nation River. Land Information Ontario (LIO) and Aquatic Resource Area (ARA) mapping has defined Butternut Creek as having an unknown thermal regime and is likely a warmwater thermal regime. Butternut Creek is a permanent watercourse and contains the following fish species: Brook Stickleback (*Culaea inconstans*), Central Mudminnow (*Culaea inconstans*), Northern Pike (*Esox Lucius*), Northern Redbelly Dace (*Chrosomus eos*), and White Sucker (*Catostomus commersonii*).

The field investigation was completed by walking along the shoreline of Butternut Creek within the study area. Electrofishing surveys were not part of the scope of work this project. As such background information and watercourse habitat information was recorded. Young-of-year fish species from the minnow family (Cyprinidae) were observed within Butternut Creek at the time of the field investigation.

Butternut Creek flows towards the east and at the time of the field investigation had very still, turbid water with abundant emergent plants, mostly grasses with some arrowhead sp. The banks were undercut, dominated by grass species with sparse trees and shrubs. The substrate consisted of clay with some boulders and cobble. Erosion issues and heavily undercut banks were evident along the left bank. Butternut Creek provides warm water fish habitat.

As per the MNRF Kemptville District's in-water timing guidelines for small rivers and streams within the district, no in-water works are to occur between March 15 and June 30, of any year (in order to avoid impacting spring spawning baitfish species).

4.1.5 Species at Risk

Ontario wildlife atlases were reviewed for species at risk (SAR) Element Occurrence (EO) records within 5 km of the study area. The Ontario Reptile and Amphibian Atlas (Ontario Nature, 2017) identified records of:

- Snapping Turtle *(Chelydra serpentina)*;
- Blanding's Turtle, and
- Northern Map Turtle (*Graptemys geographica*).

Suitable Snapping Turtle habitat is present within Butternut Creek.

The Ontario Breeding Bird Atlas (Bird Studies Canada et al., 2006) identified eight (8) SAR birds known to occur within 10 km of the study area:

- Bank Swallow (*Riparia riparia)*;
- Barn Swallow (*Hirundo rustica)*;
- Black Tern (*Chlidonias niger*);
- Chimney Swift (*Chaetura pelagica*);
- Eastern Meadowlark;
- Eastern Wood-peewee (*Contopus virens*);
- Grasshopper Sparrow (*Ammodramus savannarum*);
- Wood Thrush (*Hylocichla mustelina)*.

An Eastern Meadowlark was heard in the graminoid field south of the study area (south of Route 800 East) and several Barn Swallows were observed foraging over the wheat field northeast of the watercourse within the study area. No Barn Swallow nests were observed in association with Bridge C001. The open fields (grassed and agricultural) surrounding the study area may provide habitat for species such as Bobolink (*Dolichonyx oryzivorus*) and Grasshopper Sparrow. Additionally, the wooded areas surrounding the study area may provide suitable habitat for Wood Thrush and other migratory bird species.

Eastern Meadowlarks and Barn Swallows are listed as a threatened species both provincially and federally and receive habitat protection under the *Endangered Species Act*. No other SAR were observed during the field investigation.

MNRF Make a Map: Natural Heritage Areas (Natural Heritage Information Centre) mapping application identified the following SAR within 2 km of the study area:

- American Eel (*Anguilla rostrata*);
- Bobolink, and
- Eastern Meadowlark.

DFO Aquatic SAR mapping tool found no aquatic SAR records within or adjacent to the study area.

No snag trees were observed with the forested area, that could be potentially used by SAR bats as maternity roosting trees. Furthermore, common milkweed was observed within the study area and therefore, it is possible that Monarch use this area for various life stages.

4.1.6 Groundwater

A search of the publicly accessible MECP well records within 500 m of the study area identified six (6) water supply wells; three (3) of the wells are domestic, one (1) public well and two (2) wells used for livestock. The wells were constructed between 1950 and 2009 to an average depth of 17.18 m below ground surface (MECP, 2021). Evidence of groundwater seepage was present within the study area, indicated by the presence of watercress within Butternut Creek at the St. Albert Road culvert.

4.1.7 Surface Water

Bridge C001 crosses Butternut Creek which is a tributary of the South Nation River. Butternut Creek is approximately 0.92 km long.

4.1.8 South Nation Source Protection Area

The study area is located within the South Nation Source Protection Area (SNSPA), which is subject to the Raisin-South Nation Source Protection Plan (RSNSPP, 2016). The Bridge C001 study area is located within an Intake Protection Zone 2 (IPZ).

The Ministry of Environment, Conservation, and Parks (MECP) Source Protection Information Atlas indicates the Bridge C001 study area with the following:

- Wellhead Protection Area: No
- Wellhead Protection Area E (GUDI): No
- Intake Protection Zone: Zone 2
- Issue Contributing Area: No
- Significant Groundwater Recharge Area: No
- Highly Vulnerable Aquifer: Yes
- Event-Based Area: No
- Wellhead Protection Area Q1: No
- Wellhead Protection Area Q2: No
- Intake Protection Zone Q: No

4.1.9 Physiography, Soils and Bedrock

The study area lies within in the Lake Simcoe-Rideau Ecoregion (Ecoregion 6E), of the Mixed Plains Ecozone within the Great Lakes-St. Lawrence Forest Region. This ecoregion is exemplified by its limestone substrate characteristics. The substrate predominantly contains a deep layer of mixed limestone with underlying bedrock. The majority of the ecoregion consists of croplands, pastures, and abandoned fields (Crins et al., 2009). Soil materials are of deep marine

depositional origin and consist of nonstony clay loam and silty clay loam (Schut et al., 1987). North Gower association landscapes are nearly level to very gently sloping and have relatively high agricultural capability (Schut et al., 1987).

4.1.10 Designated Areas

The study area is in close proximity to an wetland evaluated as other identified as the Moose Creek Wetland, located approximately 2 km east of the study area.

A Candidate Life Science Area of Areas of Natural and Scientific Interest (ANSI) identified as the Moose Creek Bog was noted approximately 2 km east of the study area.

4.2 Existing Bridge Condition

The existing Bridge C001 is a single-span 8.0 m long concrete slab on steel girder bridge. Bridge C001 spanned over a section of the Butternut Creek, with each abutment located approximately at the edge of the watercourse and was built in 1951. The bridge is a single lane, asphalted road that accommodates two-way traffic and terminates in a dead end approximately 1 km east of the bridge. The bridge railings are comprised of steel posts set into the concrete abutment or attached to the steel girders and linked by steel cables. Railing along the approach to the bridge are comprised of timber posts linked by steel cables.

OSIM inspections noted that bridge required an updated barrier system, deck drains, barrier wall replacement, bearing replacement and painting of the structural steel. The deck top requires patch deck top waterproof and pave and noted the abutments and girders were salvageable.

4.3 Archaeological Resources

McIntosh Perry retained Past Recovery Archaeological Services Inc. to carry out a Stage 1 & 2 Archaeological Assessment of lands with the potential to be impacted by the construction of the new road alignment (St. Albert Road to Route 800 East) to by-pass the creek on the north-east side.

4.3.1 Stage 1 and 2 Archaeological Assessment

A Stage 1 and 2 Archaeological Assessment was conducted by Past Recovery Archaeological Services Inc. (Past Recovery) on April 20, 2022. The objective of the Stage 1 Archaeological Assessment was to compile available information known and potential cultural heritage resources within the study area and provide direction for the protection, management and/or recovery of these resources, consistent with the Ministry of Tourism, Sport and Culture (MTSC) Guidelines.

The Stage 1 Archaeological Assessment resulted in portions of the subject property possessed potential for pre-Contract and post-Contact archaeological resources.

The purpose of the Stage 2 assessment was to determine whether the property contained archaeological resources requiring further assessment, and if so to recommend an appropriate Stage 3 assessment strategy. The study area is comprised of an active agricultural field, small wooded areas, and road rights-of-way, the assessment was

conducted by means of a combination of shovel test pit survey at five metre intervals and pedestrian survey at five metre intervals across all portions of the study area determined to exhibit archaeological potential.

No archaeological resources were recovered as part of the Stage 2 assessment.

For information on the Stage 1 and 2 Archaeological Assessment, please refer to the Stage 1 and 2 Archaeological Assessment Report prepared by Past Recovery (**Appendix B**).

4.4 Cultural Heritage Value

Under the MCEA system, any bridge that is 40 years old and over is subject to a Cultural Heritage Evaluation Report (CHER). Laurie Smith Heritage Consulting carried out a Cultural Heritage Evaluation and Heritage Impact Assessment (CHE/HIA) for Bridge C001 in 2013, as it is known that the bridge was constructed in 1951 and was 62 years old at the time of the evaluation.

To be designated under *O. Reg. 9/06,* a property must meet one or more of the criteria grouped into the categories of design or physical value, historical or associative value, and contextual value. The bridge was determined to not have cultural heritage value. There are no potential impacts on cultural heritage value and no mitigation measures are required.

5.0 CONSULTATION PROGRAM

Consultation is a key component of the MCEA process for Schedule "B" projects. It is important for members of the community and stakeholders to provide balanced and objective information and consulting them to obtain feedback on the study process, alternatives, and preliminary technically preferred solution.

A consultation program was developed specific to this study under the following basis:

- Present clear and concise information at key stages of the study process;
- Solicit community, regulatory and municipal staff input;
- Identify concerns related to the undertaking;
- Consider stakeholder comments when developing the technically preferred solution; and
- Meet MCEA consultation requirements.

Consultation early and throughout the MCEA process attempts to meet the growing expectation on the part of the public that they will be consulted regarding decisions made by public decision-making bodies.

5.1 Project Contact List

A Project Contact List was developed at the initiation of this study and regularly updated throughout the course of the project to add, remove or revise information as necessary. The Project Contact list includes government ministries/agencies, municipal staff, emergency services, school boards, student transportation, businesses, potentially affected pubic, member of provincial parliament, Indigenous Communities and key interest groups (**Appendix D**).

5.2 Study Commencement

Notice of Study Commencement letters were distributed by McIntosh Perry on September 19, 2022, to the project Contact List. The Notice of Study Commencement was posted to the Nation Municipality's website. The Notice of Study Commencement can be found in **Appendix C**.

A summary of the comments received from the Notice of Study Commencement will be summarized in Table 1 below. Responses received by various stakeholders as a result of the Notice of Study Commencement and consultation responses, including emails received and sent by the project team, will be enclosed in **Appendix D.**

5.3 Indigenous Community Involvement

Engaging Indigenous Communities is an important way of acknowledging interest in the stewardship of their heritage. The project team reached out to the Ministry of Environment, Conservation and Parks (MECP) for input and recommendations on the Indigenous Communities contacts who may have an interest in this project.

The following Indigenous Communities were engaged during the consultation process for this MCEA study: Mohawk Council of Akwesasne and Metis Nation of Ontario. A summary of the consultation responses with Indigenous Communities has been included in Table 1 and documentation of conversations had can be found in **Appendix D**.

Table 1: Responses to Notice of Study Commencement		
Stakeholder/Agency	**Comments Received**	**How It Was Addressed / Response Sent**
Pending		
Pending		

5.4 Study Completion

A Notice of Study Completion will be distributed by McIntosh Perry in May 2022 pending comments received during the MCEA consultation process. The Notice of Study Completion will be posted on the Nation Municipality's website. The Notice of Study Completion can be found in **Appendix C**.

The purpose of the Notice of Study Completion is to advise of the commencement of the 30-day comment period for the Project File Report prepared as part of this MCEA. The Notice of Study Completion advises that Interested persons may provide comment to the project team within 30 calendar days from the start of the comment period . In addition, the letter advises that a request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study (i.e., requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the request order may prevent, mitigate or remedy adverse impacts to constitutionally protected Aboriginal and treaty rights. Requests on other ground will not be considered.

6.0 EVALUATION OF ALTERNATIVE SOLUTIONS

An evaluation of Alternative Solutions was undertaken to address the problem and opportunity statement identified for this project (Section 3.1), considering all aspects of the MCEA study. The overall assessment and evaluation process followed two basic concepts:

1. Assessment of Alternatives: the potential benefits of each alternative are assessed against a comprehensive set of criteria for Transportation/Operational, Structural Integrity/Public Safety, Natural Environment, Socio-Economic/Cultural Environment and Implementation factor groups.

2. Evaluation of Alternatives: A comparative evaluation of alternatives to identify a preliminary technically preferred design alternative.

An evaluation framework was developed by the Project Team, including technical considerations and environmental components that address the broad definition of the environment as described in the EAA and those based on comments received from relevant agencies. The evaluation of alternatives was carried out using the Reasoned Argument method of comparing differences in impacts and providing a clear rationale for the selection of the technically preferred alternative. **Table 2** identifies the evaluation criteria and rationale, as well as the criteria measures and corresponding descriptions.

The evaluation of Alternative Solutions considers the positive and negative potential impacts associated with each of the design alternatives in consideration of the criteria listed in **Table 2**. This evaluation is a relative comparison to be used to determine which alternative is technically preferred.

As illustrated in **Figure 3**, each criterion was given a score on a scale from least preferred (empty circle) to most preferred (solid circle).

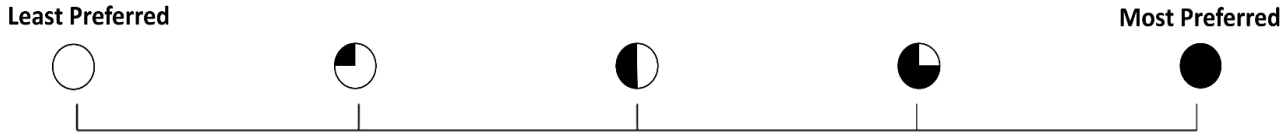


Figure 3: Evaluation of Alternative Solutions Scale of Preference

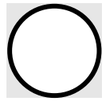
Table 2: Evaluation Criteria and Measures							
Evaluation Criteria	**Description of Criteria**	**Criteria Measures**	**Description of Criteria Measures**	**Alternative 1** (Do Nothing)	**Alternative 2** (Rehabilitate the Existing Bridge)	**Alternative 3** (Replace the Existing Bridge with a New Structure)	**Alternative 4** (Decommission the Existing Bridge and Construct a New Road Alignment for Route 800)
Transportation / Operational	Criteria to evaluate whether the alternative Solution addresses the problem and opportunities identified at Bridge C001; as well as, evaluate the operational suitability and engineering characteristics of the Solution.	Safety	Potential to address safety considerations related to current road/bridge standards.	 - Does not address safety concerns with the conditions of the existing bridge (structurally and roadside safety). - Continued deterioration of the bridge may result in no connectivity/access to St. Albert Road and Route 800 East.	 - Addresses safety concerns with the existing bridge for the short term. - No changes to accessibility. Bridge would continue to provide only a single lane of two-way traffic. - Meet current standards.	 - Addresses safety concerns with the existing bridge for the long term. - Improvements to accessibility. New structure would have sufficient width to accomodate two lanes of traffic. - Meet current standards.	 - Addresses safety concerns with the existing bridge for the long term as the bridge would be decommissioned. Enhancements to the structure guards would be required if the structure remains open for pedestrians and cylcists. - No changes to accessibility. - Condition of structure would need to be continuously monitored to ensure safety (for pedestrians, cyclists, etc).
		Accessibility	Potential impacts on existing residential access along the corridor				
Technical / Structural	Criteria to evaluate the alternative Solutions to determine which will have the least risks and greatest extension of service life.	Extension of Service Life	The amount of time that is anticipated for the design alternative to provide safe service, before needing rehabilitation/replacement works.	 - This alternative does not extend the service life of the existing bridge. - This option does not improve the durability of Bridge C001. - High structural engineering risk as inspections have already concluded that the bridge is at the end of its lifespan - No impacts to utilities	 - This alternative would extend the service life of the existing bridge by up to 15 years. - Durability is marginally improved as most components of the existing bridge are in poor condition and after rehabilitation would only be considered in fair condition. - High structural engineering risks due to poor condition of substructure and	 - This alternative would extend the service life of the existing bridge by up to 75 years. - Durability is improved with a new structure. - Low structural engineering risks are as all components would be new and designed to current engineering standards. - Impacts to existing overhead communication	 - This alternative does not extend the service life of the existing bridge, however, provides an alternative route. - Durability is maintained as vehicles would be prohibited from using the decommissioned structure. - Low structural engineering risks as loading on the bridge would be reduced with decommissioning. (Condition of structure
		Durability	The ability to withstand wear, pressure or damage.				
		Structural Engineering Risks	Based on the existing information known about the bridge, what level of structural engineering risk does each alternative consider.				

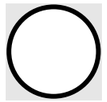
Table 2: Evaluation Criteria and Measures							
Evaluation Criteria	**Description of Criteria**	**Criteria Measures**	**Description of Criteria Measures**	**Alternative 1** (Do Nothing)	**Alternative 2** (Rehabilitate the Existing Bridge)	**Alternative 3** (Replace the Existing Bridge with a New Structure)	**Alternative 4** (Decommission the Existing Bridge and Construct a New Road Alignment for Route 800)
		Utilities	Potential impacts on existing utilities within study area. Coordination with utilities is expected for all Alternatives considered.		superstructure resulting in reduced feasibility of this alternative. - No impacts to utilities	line during construction is anticipated.	would need to be continuously monitored to ensure safety). - No impacts to utilities.
Natural Environment	Criteria to evaluate the alternative Solution's effects on the natural heritage systems, natural environment and habitats, and water quality.	Environmentally Sensitive Areas	Proximity, size, characteristics and sensitivity of significant natural areas and potential impacts on these natural systems	 - Continued deterioration of the bridge will have significant impacts to the natural environment with structure debris and erosion from the road embankment entering into Butternut Creek. There is also the potential for the structure to collapse into the watercourse which would require extensive in-water work for removal. - High impacts to fisheries and acquatic habitats with the potential for erosion/debris and structure collapse. - Moderate impacts to water quality in Butternut Creek from erosion/debris. - No impacts to climate change.	 - High impacts to environmentally sensitive areas/wildlife habitat for the construction of the detour road and bailey bridge which would impact the riparian zone on both sides of Butternut Creek. - High impacts to wildlife habitats with the removal of trees and vegetation for the construction of the detour road. - Low impacts to fisheries and aquatic habitats as there would be no-in-water work. - High impacts to species at risk habitat with the rehabilitation of the bridge deck (common for barn swallow nests), disturbance of the riparian zone (common for bank swallows, turtles, etc.) - No impacts to ground and surface water quality/quantity as there would be no in-water work.	 - High impacts to environmentally sensitive areas/wildlife habitat for the construction of the detour road and bailey bridge which would impact the riparian zone on both sides of Butternut Creek. - High impacts to wildlife habitats with the removal of trees and vegetation for the construction of the detour road. - High impacts to fisheries and aquatic habitats as there would be in-water work for the construction of the new structure and dewatering required to facilitate construction. - Low impacts to ground and surface water quality/quantity with potential risk of sediment being released to Butternut Creek during dewatering. - No impacts to climate change.	 - Low impacts to environmentally sensitive areas/wildlife habitat as the new road alignment would avoid the riparian zone and would not require tree removal. - Low to moderate impacts to wildlife habitat for nesting birds within the agricultural lands and roadside ditches. - No impacts to fisheries and acquatic habitat as there would be no-in-water work. - Low impacts to species at risk with removal of agricultural lands. - Low to moderate impacts to ground and surface water quality/quantity with the conversion of overland flow paths (sheet flow across agricultural field) to chanelized flow paths (new ditches along new road alignment) and increase in run-off resulting from the change from agricultural
		Wildlife Habitats (Terrestrial)	Presence of terrestrial wildlife habitat areas and potential impacts				
		Fisheries/Aquatic Impacts	Presence of fish communities and aquatic habitats; and potential impacts, including to water quality				
		Species at Risk	Presence of SAR and potential impacts/opportunities for mitigation				
		Ground and Surface Water Quality/Quantity	Potential impacts to surface water and ground water resources and quality				
		Climate Change	Expected production of greenhouse gas emissions and impacts on carbon sinks; and resilience or vulnerability to changing climatic				

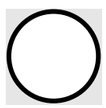
Table 2: Evaluation Criteria and Measures							
Evaluation Criteria	**Description of Criteria**	**Criteria Measures**	**Description of Criteria Measures**	**Alternative 1** (Do Nothing)	**Alternative 2** (Rehabilitate the Existing Bridge)	**Alternative 3** (Replace the Existing Bridge with a New Structure)	**Alternative 4** (Decommission the Existing Bridge and Construct a New Road Alignment for Route 800)
			conditions (climate change adaptation)		- No impacts to climate change.		land to hard surface pavement. - Low impacts to climate change with the conversion of agricultural lands to hard surface pavement.
Social and Cultural Environment	Criteria to evaluate the alternative Solution's effects on community and social features, businesses, properties, and, archaeological, built and cultural heritage features within the study area.	Land Use / Socio-Economic Conditions	Presence, number and characteristics of residences, community facilities, public parks, institutions or businesses within or adjacent to the study corridor.	 - No impacts to land use/socio-economic conditions - No anticipated impacts to cultural heritage and archaeological resources. - No construction impacts	 - Low impacts to land use/socio-economic conditions with temporary limited interest (temporary property required) for the detour road and bailey bridge. - No anticipated impacts to cultural heritage and archaeological resources. - Low construction impacts to local residents with construction duration anticipated to be one construction season.	 - Low impacts to land use/socio-economic conditions with temporary limited interest (temporary property required) for the detour road and bailey bridge. - No anticipated impacts to cultural heritage and archaeological resources. - Moderate construction impacts to local residents with construction duration anticipated to be multiple construction seasons.	 - High impacts to land use/socio-economic conditions with permanent property acquisition required for the road realignment.. - - No anticipated impacts to cultural heritage and archaeological resources. - Low construction impacts to local residents with construction duration anticipated to be one construction season.
		Archaeological, Built Heritage and Cultural Heritage Features	Presence and characteristics ofla registered archaeological resources and designated built heritage resources under the Heritage Act; as well as, potential impacts on archaeological/built and cultural heritage resources within study area				
		Construction Impacts	Duration of construction, staging options and potential for construction-related impacts on traffic circulation, access, noise and dust.				
Implementation	Criteria to evaluate the financial implications and implementation opportunities of the alternative Solution.	Capital Costs	Capital cost of proposed improvement	 - Lowest capital cost.. - Operational and Maintenance costs are anticipated to be low. With no extension of service life,	 - Second lowest capital cost. This alternative is considered to be the least economical option based on the lower extension of	 - Highest capital costs., This alternative is the more economical solution compared to rehabilitation based on the higher	 - Costs associated with this option are the sSecond highest capital cost. - Operational and Maintenance costs are

Table 2: Evaluation Criteria and Measures							
Evaluation Criteria	**Description of Criteria**	**Criteria Measures**	**Description of Criteria Measures**	**Alternative 1** (Do Nothing)	**Alternative 2** (Rehabilitate the Existing Bridge)	**Alternative 3** (Replace the Existing Bridge with a New Structure)	**Alternative 4** (Decommission the Existing Bridge and Construct a New Road Alignment for Route 800)
		Operational and Maintenance Costs	Operational and maintenance costs of proposed improvement over life-cycle	this option will require annual structural assessments and recurring maintenance for erosion of the road embankment.	service life (15 years) and it should also be noted that the cost estimate may be significantly variable based on the conditions revealed during the inspection. - Operational and Maintenance costs are anticipated to be high.	extension of service life (75 years). - Operational and Maintenance costs are anticipated to be low to moderate.	anticipated to be low to moderate. due to this option requiring annual structural assessments.

7.0 RECOMMENDED ALTERNATIVE SOLUTION

The alternatives were assessed against the evaluation criteria as appropriate. The overall comparative evaluation of alternatives were based on a qualitative methodology and did not include the assignment of factor significance weightings.

The selection of the recommended alternative solution involved identifying and making trade-offs among the advantages and disadvantages of the alternatives. The alternative that had the most overall advantages was recommended as the technically preferred alternative.

Based on the comparative analysis of alternative planning solutions, the alternative design solutions address the problem and opportunity statement for the project, apart from Alternative 1. However, in consideration of significant negative natural environment impacts and implementation cost vs benefit impacts associated with Alternative Solution 3 and 4 and significant engineering risks associated with Alternative Solution 2, the recommended alternative solution has been selected as Alternative Solution 4.

Alternative Solution 4 allows the Nation Municipality to provide safe and reliable connectivity on Route 800 East over Butternut Creek. This option was determined to have the best balance of benefits for transportation/operational, technical/structural while having moderate impacts to socio-economics and the natural environment. This option does have the second highest costs, however, this alternative is the more economical solution based on the low to moderate operational and maintenance costs.

8.0 SUMMARY AND CONCLUSIONS

During this Municipal Class EA, the Nation Municipality and McIntosh Perry Project Teams will work with key stakeholders to address and resolve key issues and challenges associated with evaluating alternative options to resolve issues related to Bridge C001.

Based on the comprehensive review of four (4) different alternative solutions against a multiple bottom line evaluation process that takes into consideration environmental, social, constructability, financial, and operational factors, Alternative 4 - Decommission the Existing Bridge and Construct a New Road Alignment, was identified as the ***Recommended Alternative solution*** to the problem statement for this study.

The recommended solution offers the best asset value to the Nation Municipality from an operations, maintenance and lifecycle perspective, whilst having minimal overall impact to the natural environment.

Pending comments received during the Notice of Commencemetn and during the 30-day review process, it is recommended that the Nation Municipality proceed with detailed design of Alternative 4.

APPENDIX A – SUMMARY OF EXISTING ENVIRONMENTAL CONDITIONS

McINTOSH PERRY

MEMORANDUM

To: Marc Legault, Director of Public Works
The Nation Municipality
County Road 9, Fournier, ON

From: Erik Pohanka, Biologist
McIntosh Perry Consulting Engineers Ltd.

c.c. Kerry Reed, Environmental Planner
McIntosh Perry Consulting Engineers Ltd.

Date: December 17, 2021

Re: The Nation Municipality Route 800 – Environmental Screening

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This memorandum provides a summary of the environmental screening services completed by Erik Pohanka of McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) to document the existing environmental conditions at the intersection of Route 800 and St. Albert Road within The Nation Municipality (the Nation) that has been proposed to be reconfigured. The study area is comprised of Route 800 from St. Albert Road for approximately 220 m eastward, St. Albert Road from Route 800 for approximately 250 m northward, and adjacent land in the northeast quadrant of the intersection.

Methodology

Prior to McIntosh Perry conducting the field investigation of the study area, background SAR information was collected through a desktop review obtained from various sources including:

- Correspondence with the Ministry of Environment, Conservation and Parks (MECP) (Appendix A);
- The Land Information Ontario (LIO) Metadata Management Tool Aquatic Resource Area (ARA) database (Ministry of Northern Development, Mines, Natural Resources and Forestry [NDMNRF], 2021);
- The Fish ONline database (NDMNRF, 2021);
- Fisheries and Oceans Canada (DFO) Species at risk (SAR) mapping tool (DFO, 2021);
- LIO was consulted for natural heritage information in the vicinity of the study area (NDMNRF, 2021);
- Natural Heritage Information Centre (NHIC) Make a Map Data Tool (NDMNRF, 2021);
- The Atlas of the Breeding Birds of Ontario (OBBA) (Bird Studies Canada et al., 2008);
- The Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2020), and
- The Ontario Butterfly Atlas (OBA) (Toronto Entomologists' Association, 2020).

In order to acquire information on SAR habitat present within and adjacent to the study area, a field investigation was carried out by McIntosh Perry staff on May 26, 2021. The investigation included identification and mapping of

the following, where applicable:

- Watercourse morphology;
- Habitat features (e.g., riffles, pools, woody debris, undercut banks, boulder clusters, etc.);
- Groundwater seepage areas, watercourse substrate, bank stability, riparian and aquatic vegetation;
- Specialized habitat areas (spawning, nursery, rearing, migratory, and food supply areas);
- Physical migration barriers;
- Suitable habitat for aquatic and terrestrial species at risk (SAR) and potential nesting opportunities for migratory birds, and
- Potential habitat compensation or enhancement opportunities.

Desktop SAR Screening

The Nation retained McIntosh Perry to provide a desktop review of background information regarding fisheries and SAR information within and adjacent to the study area. Background fisheries and SAR information is summarized in Table 1.

Table 1: Background Information for Route 800

Source	Data
Correspondence with MECP (2021)	• MECP indicated that Bobolink (Dolichonyx oryzivorus) and Eastern Meadowlark (Sturnella magna) are known to be present directly adjacent to the study area and species specific (targeted) surveys will be required to determine the extent of the habitat use within the study area.
ARA data from the LIO database (NDMNRF, 2021)	• Butternut Creek is known to contain the following species of fish: Brook Stickleback (Culaea inconstans), Central Mudminnow (Umbra limi), Northern Pike (Esox lucius), Northern Redbelly Dace (Chrosomus eos), and White Sucker (Catostomus commersonii), and • Butternut Creek is a tributary of South Nation River which is known to contain the following species of fish: American Eel (Anguilla rostrata), Banded Killifish (Fundulus diaphanus), Black Crappie (Pomoxis nigromaculatus), Blackchin Shiner (Notropis heterodon), Bluntnose Minnow (Pimephales notatus), Brown Bullhead (Ameiurus nebulosus), bullheads (Ameiurus sp.), Carps and Minnows (Cyprinidae), Common Carp (Cyprinus carpio), Common Shiner (Luxilus cornutus), Golden Shiner (), Johnny Darter/Tesselated Darter (Etheostoma spp.), Logperch (Percina caprodes), Mimic Shiner (Notropis volucellus), redhorses (Moxostoma sp.), Northern Pike, Pumpkinseed (Lepomis gibbosus), Smallmouth Bass (Micropterus dolomieu), suckers (Catostomidae), sunfishes (Centrarchidae), Walleye (Sander vitreus), White Sucker, Yellow Bullhead (Ameiurus natalis), and Yellow Perch (Perca flavescens).
Fish ON-Line database (NDMNRF, 2021)	• Butternut Creek is a tributary of South Nation River which is known to contain the following species of sport fish: Black Crappie, Brown Bullhead, Channel Catfish (Ictalurus punctatus), Common Carp, Freshwater Drum (Aplodinotus grunniens), Goldeye (Hiodon alosoides), Largemouth Bass (Micropterus salmoides), Mooneye (Hiodon tergisus),

Table 1: Background Information for Route 800	
Source	Data
	Muskellunge (Esox masquinongy), Northern Pike, Pumpkinseed, Rock Bass (Ambloplites rupestris), Sauger (Sander canadensis), Smallmouth Bass, Walleye, White Crappie (Pomoxis annularis), White Sucker, Yellow Bullhead, and Yellow Perch.
NHIC Data from the LIO database (NDMNRF, 2021)	• The following SAR have been recorded within 2 km of the study area: American Eel, Bobolink, and Eastern Meadowlark, and • The following Natural Areas are present within 2 km of the study area: Moose Creek Wetland and Moose Creek Bog.
LIO Data (NDMNRF, 2021)	• Unevaluated wetlands (swamps) associated with Butternut Creek are present north and directly south of the study area, and • Moose Creek Wetland (swamp) evaluated swamp (designated as 'other') and Moose Creek Bog Area of Natural and Scientific Interest (ANSI) that are located approximately 1.9 km east of the study area.
DFO Aquatic SAR Mapping (DFO, 2021)	• No aquatic SAR were identified within or adjacent to the study area.
OBBA (Bird Studies Canada et al., 2008)	• The following SAR birds are known to breed within a 10 km range of the study area: Bank Swallow (Riparia riparia), Barn Swallow (Hirundo rustica), Black Tern (Chlidonias niger), Bobolink, Chimney Swift (Chaetura pelagica), Eastern Meadowlark, Eastern Wood-Pewee (Contopus virens), Grasshopper Sparrow (Ammodramus savannarum), and Wood Thrush (Hylocichla mustelina).
ORAA (Ontario Nature, 2020)	• The following SAR herptiles are known to be present within a 10 km range of the study area: Common Snapping Turtle (Chelydra serpentina) and Northern Map Turtle (Graptemys geographica).
OBA (Toronto Entomologists' Association, 2020)	• The following SAR butterflies are known to be present within a 10 km range of the study site: Monarch (Danaus plexippus).
Official Plan – United Counties of Prescott and Russell (United Counties of Prescott and Russell, 2018)	• The study area is in an 'Agriculture Resource Area'; • Butternut Creek is considered a wildlife travel corridor throughout the study area, and • Butternut Creek within the study area is considered an 'Intake Protection Zone (Type 2)'.
South Nation Conservation Authority (SNC) Regulation Mapping (SNC, 2021)	• The property is located outside of regulated areas under Ontario Regulation 170/06; • A wetland is present directly south of the Route 800 culvert, and • The study area is located within 'Drinking Water Source Protection Area'.

Field Investigations

McIntosh Perry staff conducted a field investigation on May 26, 2021 to inspect the study area for any fisheries and SAR concerns. The field investigation included a walkthrough of the study area to document existing conditions and

document fish habitat, SAR, and SAR habitat. The study area was inspected for hollow and snag trees as well as Butternuts within 25 m of the proposed footprint of the reconfiguration.

During the field investigation, the study area consisted of the following vegetation communities:

- Dry – Fresh Graminoid Meadow (MEGM3) was present in the northeast corner of the St. Albert Road/Route 800 intersection. This area was roughly square in area with approximately 60 of frontage on each road. The vegetation community consisted of a meadow dominated by grasses with sparse individual white elm (Ulmus americana) and red maple (Acer rubrum) trees. These conditions were also present on the north side of Butternut Creek, on the east side of St. Albert Road;
- Dry – Fresh White Ash Deciduous Woodland (WODM4-1) was present on the north and east sides of the MEGM3 vegetation community. This area consisted of a wooded area dominated by dead white ash (Fraxinus americana);
- Dry – Fresh Deciduous Woodland (WODM4) was present along the southwest bank of Butternut Creek as well as on the east side of Butternut Creek directly north of Route 800. These areas consisted of wooded areas dominated by basswood (Tilia americana) and bur oak (Quercus macrocarpa);
- The majority of the east and north sides of Butternut Creek consisted of an agricultural field (AG) comprised of wheat which also formed the adjacent land to the northeast;
- Adjacent land to the south and southwest of the study area consists of agricultural fields and residential property. An unevaluated wetland (swamp) is adjacent to the study area to the southeast. Adjacent land to the west of the study area consists of residential property and agricultural fields;
- No Butternuts (Juglans cinerea) were observed within the study area, and
- No significant snag trees or hollow trees were observed within the study area.

A permanent warm-water watercourse called Butternut Creek flows through the study area in a northwest direction. The flow was very slow and mainly still throughout the study area, during the May 26, 2021 field investigation. The water was turbid (brown) with abundant emergent grasses and very limited submergent watercress (Nasturtium officinale). In areas where substrate was visible (adjacent to the culverts), clay was dominant with some boulders and cobble mixed into the substrate. Some portions of the banks were observed to be bare and undercut with heavier undercutting and erosion along the left bank (looking upstream). Riparian vegetation consisted of dominant grasses with sparse deciduous trees and shrubs. Young-of-year (YOY) minnows (Cyprinidae) were observed in the watercourse flowing through the Route 800 culvert. Habitat for warm-water sport fish and baitfish is present throughout the study area. Potential Northern Pike Spawning habitat is present along the grassed banks of the watercourse within the study area, particularly the low-lying right bank (looking upstream) during periods of high water in early spring. Other specialized habitat was unable to be determined due to the turbidity of the water and lack of detailed fish surveys.

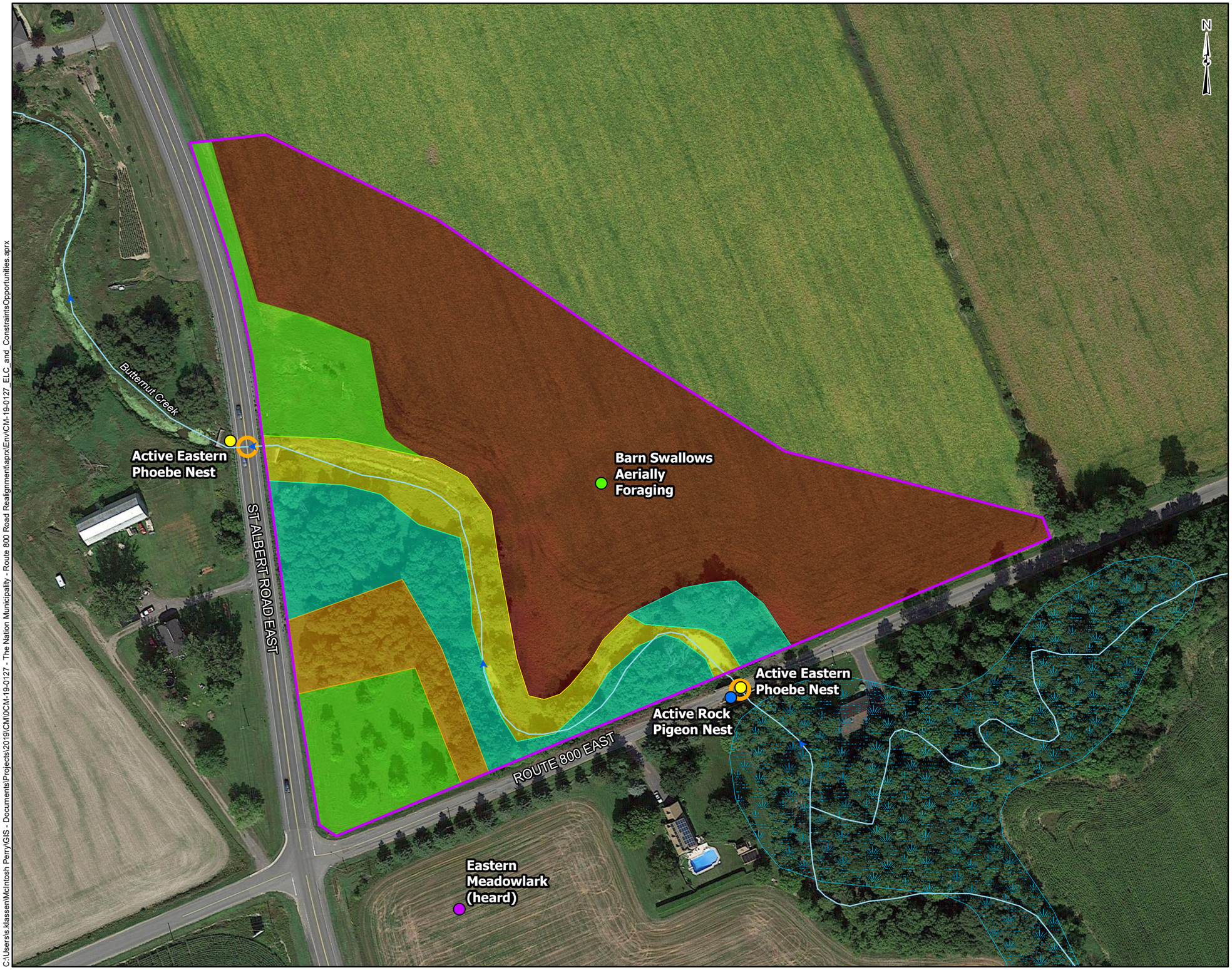
Suitable migratory and foraging habitat for Common Snapping Turtle is present throughout Butternut Creek in the study area. There were no granular shoulders adjacent to either of the culverts in the study area that could provide potential nesting habitat for Common Snapping Turtle. Although Northern Map Turtle was identified in the background information, suitable habitat is not available for Northern Map Turtles in the study area.

Active Eastern Phoebe (Sayornis phoebe) nests were observed in the St. Albert Road culvert and Route 800 culvert (one each) during the May 26, 2021 field investigation. An active Rock Pigeon (Columba livia) nest was also observed in the Route 800 culvert.

Several Barn Swallows were observed in the study area during the field investigation. The Barn Swallows were observed aerially foraging over the wheat field in the northeast end of the study area. Although the St. Albert Road culvert and Route 800 culvert provided features suitable for Barn Swallow nesting, no nesting activity or nests from previous breeding season were observed for this species.

An Eastern Meadowlark was heard singing from the agricultural field in adjacent land to the south of the study area. Although an Eastern Meadowlark was identified directly adjacent to the study area and meadows are present within the study area, it is unlikely that SAR grassland birds (i.e., Bobolink, Eastern Meadowlark, Grasshopper Sparrow) would utilize the meadow vegetation communities due to active management (mowing) of the areas and limited size of the meadows. The wheat field in the northeast end of the study area provides potential breeding habitat for SAR grassland bird habitat.

Photos from the field investigation have been included in Appendix B of this memo. A list of flora and fauna observed in the study area during the field investigation is included in Appendix C. Figure 1 illustrates the natural heritage features of the study area based on the field investigation.



LEGEND

- Culvert Location
- Study Area
- Active Eastern Phoebe Nest
- Active Rock Pigeon Nest
- Barn Swallows Aerially Foraging
- Eastern Meadowlark (heard)
- Agricultural Field - Wheat (AG)
- Warm-Water Fish Habitat/Potential Common Snapping Turtle Habitat
- Dry - Fresh Deciduous Woodland (WODM4)
- Dry - Fresh Graminoid Meadow (MEGM3)
- Dry - Fresh White Ash Deciduous Woodlot (WODM4-1)
- Unevaluated Wetland
- Waterbody
- Watercourse

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2021.

40 20 0 40

Scale 1:1,500 Metres

CLIENT: THE NATION MUNICIPALITY

PROJECT: ROUTE 800 ENVIRONMENTAL SCREENING MEMO

TITLE: NATURAL HERITAGE FEATURES MAP

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO: CM-19-0127		FIGURE: 1
Date	Dec., 09, 2021	
GIS	SK	
Checked By	EP	

C:\Users\s.klassen\McIntosh Perry\GIS - Documents\Projects\2019\CM\0CM-19-0127 - The Nation Municipality - Route 800 Road Realignment\aprx\Env\CM-19-0127_ELC_and_ConstraintsOpportunities.aprx

Proposed Works

The Nation is proposing to reconfigure the St. Albert Road/Route 800 intersection. Route 800 will be cut off on the west side of the culvert, creating a dead-end road leading to St. Albert Road. Route 800 on the east side of the culvert will be permanently closed. A new extension of Route 800 will be constructed in a northwest orientation along the north side of Butternut Creek through the existing agricultural field. No in-water work or works on the culverts are proposed as part of the reconfiguration. Route 800 will intersect with St. Albert approximately 220 m north of the existing intersection. The work is proposed to be conducted in 2022. Figure 2 outlines the proposed alignment for the new intersection configuration.

METRIC

PLATE No PLATE

ROUTE 800
REALIGNMENT

STA TO STA

Survey Revised

SHEET
01

McINTOSH PERRY Consulting Engineers Ltd.

AREA REMAINING AFTER FUTURE
ROAD ALLOWANCE = APPROX. **7 acres**

AREA REQUIRED FOR FUTURE
ROAD ALLOWANCE = APPROX. **2 acres**

ST. ALBERT ROAD

APPROXIMATE RIGHT-OF-WAY
TO BE CONFIRMED WITH LEGAL SURVEY

APPROX. CREEK SETBACK
TO BE CONFIRMED WITH SNCA

ROUTE 800

ROUTE 800

APPROXIMATE RIGHT-OF-WAY
TO BE CONFIRMED WITH LEGAL SURVEY

ST. ALBERT ROAD

Impact Assessment

Fish and Fish Habitat

Butternut Creek flowing through the study area was confirmed to be fish habitat. Potential Northern Pike spawning habitat is present; however, other specific fish habitat was not able to be determined due to site conditions (i.e., turbid waters) and lack of fish surveys. Fish in this watercourse and their habitat are protected under the Fisheries Act, 1985. No in-water works are proposed as part of the construction of the new road and intersection reconfiguration. No disturbance is anticipated to occur in the potential Northern Pike spawning habitat of the right bank in the study area as the new road will be constructed adjacent to the left bank. However, the construction of the new road adjacent to the watercourse may increase potential for road runoff and decreasing the stability of the watercourse bank which has existing erosion and undercutting. Direct negative impacts to fish and fish habitat are not anticipated to occur (i.e., no in-water work); however, indirect negative impacts to fish and fish habitat may occur if proper sediment/erosion control during construction and post-construction are not implemented.

Migratory Birds

Eastern Phoebes were observed nesting in both culverts associated with the study area. This species, their nests, eggs, and fledgelings are protected under the Migratory Birds Convention Act, 1994 (MBCA). No works are proposed on the culverts; therefore, no negative impacts to migratory birds are anticipated as part of the proposed intersection reconfiguration. Rock Pigeons are not considered native species and do not receive any protection.

SAR Fish

The American Eel is designated as 'Endangered' under the Endangered Species Act, 2007 (ESA) and receives habitat protection. Although American Eel was identified within the South Nation River, it is not likely that this species is present in Butternut Creek. The watercourse throughout the study area has a history of disturbance such as active agriculture leaving limited riparian vegetation (leading to erosion and undercutting) as well as further downstream where the watercourse is heavily impacted by recreational development (i.e., golf course). American Eels are sensitive to significant disturbance and impacts to watercourses which deters their presence. Dams are also known to create migration barriers to American Eels. Two (2) dams are present in the High Falls Conservation Area on the north side of Casselman (downstream of the study area) which likely limits migration of American Eels into the study area. As no in-water work is proposed as part of the reconfiguration and it is not likely that the study area provides suitable habitat for American Eel, it is not anticipated that negative impacts to American Eel will occur.

SAR Turtles

The Common Snapping Turtle is designated as 'Special Concern' under the ESA and Species at Risk Act, 2002 (SARA) and does not receive habitat protection. However, individuals of this species, their eggs, and nests are protected under the Fish and Wildlife Conservation Act, 1997 (FWCA). No in-water work will occur as part of the proposed reconfiguration and no nesting habitat is present within or directly adjacent to the study area; therefore, the proposed works are not anticipated to negatively impact Common Snapping Turtles.

SAR Birds

Barn Swallows were observed aerially foraging within the study area during the field investigation. The Barn Swallows were utilizing a large area of the agricultural field within and adjacent to the study area. This species is designated as 'Threatened' under the ESA and receives habitat protection. No nesting or previous nests of this species were observed in the culverts associated with the project. Although the culverts provide suitable habitat

for Barn Swallow nesting, no works on the culverts are proposed as part of the intersection reconfiguration. Critical habitat is not able to be defined due to the lack of nests. The construction of the new road will permanently remove part of the agricultural field; however, this area is not considered limiting habitat for aerial foraging as Barn Swallows will utilize a wide scale of open areas where flying insects are present. It is not anticipated that the construction of the new road will significantly reduce food abundance for Barn Swallows and does not limit aerial foraging opportunities for Barn Swallows. The proposed intersection reconfiguration is not anticipated to negatively impact Barn Swallows.

An Eastern Meadowlark was heard singing adjacent to the study area. The Eastern Meadowlark is designated as 'Threatened' under the ESA and receives habitat protection. No nesting behaviour or presence of Eastern Meadowlark or other SAR grassland birds were observed within the study area. Although no SAR grassland birds were observed, the wheat field in the northeast end of the study area provides suitable habitat for SAR grassland birds. Due to the presence of Eastern Meadowlark adjacent to the study area, it is possible that this species could utilize the study area for breeding. The single field investigation was not sufficient to determine absence/presence of SAR grassland birds in the study area; therefore, the construction of the new road through the wheat field can potentially remove SAR grassland bird habitat, including protected habitat for Eastern Meadowlark.

Recommendations and Mitigation Measures

In order to minimize or eliminate environmental impacts and to help achieve ecological and environmental improvements from the proposed construction, the following mitigation measures are recommended.

Vegetation

- Vegetation removal should be minimized to only what is required for the proposed works. If vegetation removal is to occur outside of the study area as defined during the preparation of this memo, additional surveys and/or documentation may be necessary to determine the environmental opportunities and constraints of the study area;
- To prevent the introduction and spread of invasive plant species into the site, equipment utilized during construction should be inspected and cleaned in accordance with the Clean Equipment Protocol for Industry (Appendix D);
- It is recommended that disturbed areas (i.e., laydown areas) should be replanted with locally grown native species. This would contribute to re-establishing native plants within the wider landscape and potentially have a positive impact for biodiversity (i.e., using native species of wildflowers for pollinators such as bees). Use of non-native plant material should be discouraged, and
- Exposed soils should be revegetated as soon as possible using a seed mix composed of locally native herbaceous species, and native trees and shrubs, which are appropriate for the site conditions.

Fish and Fish Habitat

- Due to the presence of a watercourse within 50 m of the proposed road construction, the following is recommended:
    - Mobile equipment refuelling should take place no closer than 30 m from any waterbody, watercourse, or wetland in order to prevent water contamination due to accidental fuel spills. For non-mobile equipment, refuelling should be carried out in a controlled manner so as to prevent fuel spillage, and drip pans should be located under parked equipment at all times;

- Equipment operating near any watercourse, waterbody or wetland should be in good working condition, properly maintained and free of excess oil/grease to reduce the risk of contaminant leakage. In the event that a spill occurs, proper containment, clean up, and reporting, in accordance with federal and provincial requirements, must be completed. The Ontario Spills Action Centre (1-800-268-6060) should be contacted and emergency spill procedures implemented immediately;
- The Contractor should take all necessary precautions to prevent the accumulation of litter and construction debris within 30 m of any watercourse;
- All watercourses are off-limits to any construction equipment;
- Replanting of riparian vegetation must follow the recommendations listed above for Vegetation;
- Proper sediment and erosion control measures must be implemented to prevent deleterious substances and deposits from entering the watercourse or altering the watercourse banks. This may include, but is not limited to: installation of geotextile fencing to prevent sediment from entering the watercourse, creating a berm stabilized with seeding and planting of native plants, and stabilizing the existing eroding bank.

Wildlife

- Before commencing any site alterations, visually inspect the work area for wildlife presence;
- Do not feed any wildlife or leave food out that may attract wildlife;
- If wildlife is encountered within the work area, keep distance and allow the animal to exit the work area, and
- The nests and eggs of many species are protected under federal and/or provincial legislation (i.e., MBCA, FWCA). Due to the presence of several migratory birds, including SAR birds (i.e., Barn Swallow, Eastern Meadowlark), vegetation clearing must occur outside of the bird nesting window of April 15 to September 15 to avoid contravention of the MBCA, FWCA, and ESA. If vegetation removal must occur within the nesting window, the Contractor must retain a qualified avian biologist to conduct a nesting survey prior to clearing. If actively nesting migratory birds are encountered at any time of year, works should not continue in the location of the nest until:
  - After it has been determined by a qualified avian biologist that the young have fledged and vacated the nest and work area; or
  - A qualified avian biologist determines a suitable buffer distance at which work may continue to prevent disturbance of the bird(s);
  - Where a buffer distance has been implemented, a qualified avian biologist must undertake monitoring during construction to ensure migratory birds and their eggs are not disturbed, destroyed or taken, and
  - Targeted "nests searches" should be avoided as this may be in contravention of the MBCA and its regulations (Note: The Canadian Wildlife Service does not support relying on inspections for migratory bird nests in such habitats due to the difficulty of locating all nests and risk to birds; therefore, it is always a better option to clear vegetation outside of the breeding bird period).

SAR

- Should any SAR be discovered during construction, a management biologist at MECP – Ottawa District should be contacted immediately, and operations modified to avoid any negative impacts to SAR or their habitat until further direction is provided by MECP;

- During the active season for turtles and snakes (May 1 to October 15), a thorough inspection of the construction area should be conducted daily by the contractor to ensure that no SAR (including Common Snapping Turtles) have entered the work area;
- All stockpiled topsoil, sand, and gravel must be completely encircled with silt fence or completely covered with geotextile to prevent turtles from accessing and nesting in the materials from May 15 to July 15 of any year;
- The timing window recommended for vegetation removal to protect migratory birds also applies to SAR birds as this timing window will accommodate the active breeding season for Barn Swallows and Eastern Meadowlark, and
- Due to the presence of Eastern Meadowlarks directly adjacent to the study are and potential breeding habitat within the study area, it is recommended that targeted surveys for Eastern Meadowlarks (and other SAR grassland birds) are conducted. The targeted surveys should be conducted following the Survey Methodology under the Endangered Species Act, 2007: Dolichonyx Oryzixorous (Bobolink) prepared by the Ministry of Natural Resources (2011) which is also applicable for Eastern Meadowlark. If it is determined that SAR grassland birds are utilizing the study area for breeding, the project must be registered to MECP under the Ontario Regulation (O. Reg.) 242/08 – General. Further mitigation measures and possible limitations may be applicable to the project after registration and consultation with MECP.

Conclusion

The proposed works are considered to have very low impacts to fish, fish habitat, wildlife habitat, and SAR, provided that the recommendations listed above are implemented. It is not anticipated that negative long-term impacts will occur to these environmental features as part of the proposed road construction and intersection reconfiguration.

Please contact the undersigned if you have any questions.

Respectfully,
McIntosh Perry Consulting Engineers Ltd.

Erik Pohanka
Biologist
Cell: 613-203-5470
e.pohanka@mcintoshperry.com

APPENDIX A: REGULATORY AGENCY CORRESPONDENCE

Erik Pohanka

From: Snell, Shamus (MECP) <Shamus.Snell@ontario.ca>
Sent: January 7, 2021 3:06 PM
To: Erik Pohanka
Subject: MECP SARB Review: The Nation Municipality Route 800 SAR Info Request
Attachments: Draft_Survey_Protocol_for_Bobolink.pdf; GHD_Bobolink.pdf; GHD_Chimney_Swift.pdf

Hi Erik,

Due to a high volume of requests received during the transition of the Endangered Species Act (ESA) from the Ministry of Natural Resources and Forest (MNRF) to the Ministry of Environment, Conservation and Parks (MECP) and work restrictions and delays as a result of COVID-19 a number of requests which came into our office during that time may not have been responded to. I am working though these requests to ensure that someone has responded to you.

The Species at Risk Branch (SARB) has conducted review of the Nation Municipality Route 800, and the areas adjacent to it for Species at Risk (SAR) occurrences and did not detected any additional SAR occurrences which were not already identified in the information request.

While this review represents MECP's best currently available information, it is important to note that a lack of information for a site does not mean that SAR or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in areas not previously surveyed. On-site assessments will be required to better verify site conditions, identify and confirm presence of species at risk and/or their habitats.

The location of the site is adjacent to observations of Bobolink and Eastern Meadowlark and the habitat onsite suggests there is a very high potential they could be nesting there. Species specific surveys will be required to determine the extent of the habitat use in these areas. A copy of a survey protocol and General Habitat Descriptions for these species have been attached to assist with this.

It is the responsibility of the proponent to ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out. If the proposed activities can not avoid impacting protected species and their habitats then the proponent will need to apply for a authorization under the Endangered Species Act.

Please note the MECP is not tasked with confirming non-SAR related information or reviewing aspects of projects that fall outside of the ESA legislative requirements. I would recommend you reach out to The Ministry of Natural Resources and Forestry (MNRF) as they remain the ministry responsible for reviewing and confirming features like Significant Wildlife Habitat, Provincially Significant Wetlands and fisheries data.

My apologies for the delay of the response.

Regards,

Shamus Snell
A/ Management Biologist

Species at Risk Branch
Ministry of the Environment, Conservation and Parks
Email: shamus.snell@ontario.ca

From: Erik Pohanka <e.pohanka@mcintoshperry.com>
Sent: July 9, 2020 12:24 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: The Nation Municipality Route 800 SAR Info Request

To whom it may concern;

Please see the attached Information Request Letter regarding the Route 800 road realignment project on behalf of The Nation Municipality.

Please feel free to contact me if you have any questions or concerns.

Thank you,

Erik Pohanka, B.Sc.
Junior Biologist
115 Walgreen Road, R.R. 3, Carp, ON, K0A 1L0
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McINTOSH PERRY

APPENDIX B: STUDY AREA PHOTOS

Photo 1: View of Butternut Creek looking downstream (northwest) from the Route 800 culvert. 26 May 2021.

Photo 2: View of Butternut Creek looking upstream (southeast) from the St. Albert Road culvert. 26 May 2021.

Photo 3: A portion of the eroding banks on the left side (looking upstream) of Butternut Creek, directly adjacent to the wheat field. 26 May 2021.

Photo 4: Potential Northern Pike spawning habitat along the low-lying right bank (looking upstream) of Butternut Creek. 26 May 2021.

Photo 5: Young-of-year (YOY) minnow (Cyprinidae) observed in Butternut Creek. 26 May 2021.

Photo 6: View of the Dry – Fresh Graminoid Meadow (MEGM3) in the northeast quadrant of the existing St. Albert Road/Route 800 intersection. 26 May 2021.

Photo 7: View of the Dry – Fresh White Ash Deciduous Woodland (WODM4-1) within the study area. 26 May 2021.

Photo 8: View of the Dry – Fresh Deciduous Woodland (WODM4) within the study area. 26 May 2021.

Photo 9: View of the agricultural field (AG) consisting of a wheat crop in the northeast portion of the study area. Barn Swallows (Hirundo rustica) were observed aerially foraging over this area. This field also provides potential SAR grassland bird breeding habitat, including Eastern Meadowlarks (Sturnella magna). 26 May 2021.

Photo 10: An active Eastern Phoebe (Sayornis phoebe) nest observed in the St. Albert Road culvert. 26 May 2021.

Photo 11: An active Eastern Phoebe (Sayornis phoebe) nest observed in the Route 800 culvert. 26 May 2021.

Photo 12: A Song Sparrow (Melospiza melodia) observed in the study area which is an example of a migratory bird protected under the Migratory Birds Convention Act, 1994. 26 May 2021.

APPENDIX C: LIST OF FLORA AND FAUNA OBSERVED IN THE STUDY AREA

List of Flora and Fauna Species Observed in the Study Area			
Common Name	Scientific Name	Common Name	Scientific Name
Woody Plants			
alternate-leaved dogwood	Cornus alternifolia	red maple	Acer rubrum
Amur maple	Acer ginnala	red-osier maple	Cornus sericea
basswood	Tilia americana	riverbank grape	Vitis riparia
bitternut hickory	Carya cordiformis	round-leaved dogwood	Cornus rugosa
black cherry	Prunus serotina	succulent hawthorn	Crataegus succulenta
bur oak	Quercus macrocarpa	Tatarian honeysuckle	Lonicera tatarica
Canada plum	Prunus nigra	thicket creeper	Parthenocissus inserta
choke cherry	Prunus virginiana	Virginia creeper	Parthenocissus quinquefolia
common buckthorn	Rhamnus cathartica	white ash	Fraxinus americana
European high-bush cranberry	Viburnum opulus	white elm	Ulmus americana
glossy buckthorn	Frangula alnus	white spruce	Picaea glauca
green ash	Fraxinus pennsylvanica	wild red raspberry	Rubus strigosus
Manitoba maple	Acer negundo	winged euonymus	Euonymus alatus
nannyberry	Viburnum lentago		
Herbaceous Plants			
Alsike clover	Trifolium hybridum	ox-eye daisy	Leucanthemum vulgare
aster	Symphyotrichum spp.	Philadelphia fleabane	Erigeron philadelphicus
broad-leaved arrowhead	Sagittaria latifolia	pondweed	Potamogeton spp.
bull thistle	Cirsium vulgare	Queen Anne's lace	Daucus carota
Canada lettuce	Lactuca canadensis	red clover	Trifolium pratense
coltsfoot	Tussilago farfara	rough-fruited cinquefoil	Potentilla recta
common burdock	Arctium minus	smooth brome	Bromus inermis
common dandelion	Taraxacum officinale	spotted jewelweed	Impatiens capensis
common duckweed	Lemna minor	stinging nettle	Urtica dioica
common milkweed	Asclepias syriaca	sweet-clover	Melilotus spp.
common mugwort	Artemisia vulgaris	tall buttercup	Ranunculus acris
common mullein	Verbascum thapsus	thimbleweed	Anemone cylindrica
common tansy	Tanacetum vulgare	Timothy grass	Phleum pratense

cow vetch	Vicia cracca	violet	Viola spp.
curled dock	Rumex crispus	Virginia waterleaf	Hydrophyllum virginianum
field horsetail	Equisetum arvense	water smartweed	Persicaria amphibia
giant ragweed	Ambrosia trifida	watercress	Nasturtium officinale
goat's-beard	Tragopogon dubius	wheat	Triticum spp.
goldenrod	Solidago spp.	white goosefoot	Chenopodium album
ground-ivy	Glechoma hederacea	wild parsnip	Pastinaca sativa
hemp dogbane	Apocynum cannabinum	wild strawberry	Fragaria virginiana
heart-leaved foamflower	Tiarella cordifolia	wood avens	Geum urbanum
meadow-grass	Poa spp.	wood-nettle	Laportea canadensis
morthewort	Leonurus cardiaca	yellow-rocket	Barbarea vulgaris
orchard grass	Dactylis glomerata		
Amphibians			
Northern Leopard Frog	Lithobates pipiens		
Birds			
American Crow	Corvus brachyrhynchos	European Starling	Sturnus vulgaris
American Goldfinch	Spinus tristis	Killdeer	Charadrius vociferus
American Robin	Turdus migratorius	Mourning Dove	Zenaida macroura
Baltimore Oriole	Icterus galbula	Northern Cardinal	Cardinalis cardinalis
Barn Swallow	Hirundo rustica	Red-eyed Vireo	Vireo olivaceus
Belted Kingfisher	Megaceryle alcyon	Red-winged Blackbird	Agelaius phoeniceus
Blue Jay	Cyanocitta cristata	Rock Pigeon	Columba livia
Brown-headed Cowbird	Molothrus ater	Song Sparrow	Melospiza melodia
Chestnut-sided Warbler	Setophaga pensylvanica	Spotted Sandpiper	Actitis macularius
Chipping Sparrow	Spizella passerina	Tree Swallow	Tachycineta bicolor
Common Grackle	Quiscalus quiscula	Turkey Vulture	Cathartes aura
Eastern Meadowlark	Sturnella magna	Warbling Vireo	Vireo gilvus
Eastern Phoebe	Sayornis phoebe	Yellow Warbler	Setophaga petechia
Mammals			
eastern chipmunk	Tamias striatus	least weasel	Mustela nivalis

APPENDIX D: CLEAN EQUIPMENT PROTOCOL FOR INDUSTRY

Clean Equipment Protocol for Industry

Inspecting and cleaning equipment for the purposes of invasive species prevention

Invasive Species Centre

Catalyst for research and response

Ontario

Peterborough County Stewardship

Ontario Invasive Plant Council

Publication Information

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Inquiries regarding this document can be directed to the Ontario Invasive Plant Council
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Peterborough, ON
K9J 8L5

Phone: (705) 748-6324
Email: info@ontarioinvasiveplants.ca

For more information on invasive plants in Ontario, visit www.ontario.ca/invasivespecies, www.ontarioinvasiveplants.ca, www.invadingspecies.com or www.invasivespeciescentre.ca

Table Of Contents

Introduction

Why Invasive Plants are a Problem

Invasive alien species are "a growing environmental and economic threat to Ontario. Alien species are plants, animals and microorganisms that have been accidentally or deliberately introduced into areas beyond their normal range. Invasive species are defined as harmful alien species whose introduction or spread threatens the environment, the economy, or society, including human health (Government of Canada 2004)." (Ontario Invasive Species Strategic Plan, 2012). The great majority of plant invasions occur in habitats that have been disturbed either naturally or by humans (Rejma´nek 1989; Hobbs and Huenneke 1992; Hobbs 2000).

The ecological effects of invasive species are often irreversible and, once established, they are extremely difficult and costly to control or eradicate. According to Pimental et al. (1999), invasive species in the U.S. cause economic and environmental damages totalling over $138 billion per year, with agricultural weed control and crop losses totalling approximately $34 billion per year. Exact figures for the total economic and environmental damages are not available for Canada. In Ontario however, the costs of dealing with just one invasive species is astonishing; Zebra Mussels cost Ontario power producers who draw water from the lake $6.4 million per year in increased control/operating costs and about $1 million per year in research costs (Colautti et al. 2006).

Invasive species can spread to new areas when contaminated mud, gravel, water, soil and plant material are unknowingly moved by equipment used on different sites. This method of spread is called an unintentional introduction, and is one of the four major pathways for invasive species introduction into a new area of Ontario (Ontario Invasive Species Strategic Plan, 2012).

Buckthorn removal, Lynde Shores Conservation Area.
Photo by: Central Lake Ontario Conservation Authority

Invasive plant seed and propagules (plant material, i.e. rhizomes) have the ability to travel sight unseen in mud attached to or lodged in various parts and spaces between parts of vehicles, machinery and other mechanical equipment. A recent study at Montana State University found that most seeds (99% on paved roads and 96% on unpaved roads) stayed attached to the vehicle after traveling 160 miles (257 km) under dry conditions.

Invasive plant species are commonly transported on or in vehicles and construction equipment when they are moved to new locations. Those vehicles include four-wheel drives, excavators, tractors, loaders, water trucks and all-terrain vehicles. Failure to properly clean vehicles and machinery of soils, mud, and contaminated water that may contain invasive species seed and propagules can result in permanent, irreversible environmental impacts. These impacts can mean substantial cost to the landowner, land manager and/or the user. Businesses may also face liability issues for activities and operations that result in the introduction of invasive species.

Some of the invasive species in Ontario which have been known to spread through equipment transfer include:

- **Common Buckthorn** *(Rhamnus cathartica)*
- **Dog-strangling Vine** *(Cynanchum rossicum)*
- **Garlic Mustard** *(Alliaria petiolata)*
- **Giant Hogweed** *(Heracleum mantegazzianum)*
- **Glossy Buckthorn** *(Frangula alnus)*
- **Japanese Knotweed** *(Polygonum cuspidatum)*
- **Miscanthus or Chinese Silver Grass** *(Miscanthus sinensis)*
- **Phragmites or Common Reed** *(Phragmites australis subsp. australis)*
- **Reed Canary Grass** *(Phalaris arundinacea)*
- **Wild Parsnip** *(Pastinaca sativa)*
- **Wild Chervil** *(Anthriscus sylvestri)*

Dog-strangling vine
(Cynachum rossicum)
Photo by: Hayley Anderson

Garlic Mustard
(Alliaria petiolata)
Photo by: Ken Towle

Phragmites
(Phragmites australis subsp. Australis)
Photo by: Michael Irvine

These plants impact biodiversity by out-competing native species for space, sunlight, and nutrients. They can also have impacts on road and driver safety by physically blocking intersection sightlines, and in the case of Phragmites and Miscanthus, may fuel intense grass fires if ignited, which can damage utility stations and hydro lines.

The harmful effects of invasive species include:

- Physical and structural damage to infrastructure
- Human health hazards (i.e. Giant Hogweed and Wild Parsnip exposure)
- Delays and increased cost in construction activities
- Environmental damage (i.e. erosion)
- Aesthetic degradation
- Loss of biodiversity
- Reduced property values
- Loss of productivity in woodlots and agriculture

Why Cleaning Vehicles and Equipment is Important

Passenger and recreational vehicles as well as heavy machinery are major vectors for spreading terrestrial invasive species into new areas.

It is much more costly to control invasive species after their establishment and spread than it is to prevent their spread. The spread of invasive species through unintentional introduction can be minimized significantly by the diligent cleaning of vehicles and equipment when leaving one site and moving to the next. In the case of large properties, cleaning before moving to a new site is recommended, even if it is within the same property.

This guide has been developed for the construction, agriculture, forestry and other land management industries, to provide equipment operators and practitioners with tools and techniques to identify and prevent the unintentional introduction of invasive species. It establishes a standard for cleaning vehicles and equipment and provides a guide where current codes of practice, industry standards or other environmental management plans are not already in place.

Passenger and recreational vehicles include:

- 2WD and 4WD cars
- 2WD and 4WD trucks
- All Terrain Vehicles (ATV's)
- Motorbikes
- Snowmobiles

Heavy machinery includes:

- Trucks
- Tractors
- Mowers
- Slashers
- Trailers
- Backhoes
- Graders
- Dozers
- Excavators
- Skidders
- Loaders
- Water Tankers and Trucks

Dog-strangling Vine plants attached to ATV.
Photo by: Francine Macdonald

Plant material attached to bobcat.
Photo by: TH9 Outdoor Services

Impacts of Invasive Species on Industry

Construction

In the UK, Japanese Knotweed (*Polygonum cuspidatum* or *Fallopia japonica*) is classified as a hazardous material. When construction occurs in established Japanese Knotweed stands workers sift the soil to remove root fragments and institute treatment plans to ensure that the Knotweed does not re-sprout, as it can damage housing foundations by growing through concrete and asphalt. The contractors must also thoroughly clean their equipment, and dispose of the contaminated soil at biohazard waste sites. While we do not have these requirements in Ontario, Japanese Knotweed is present here.

Invasive plant species can also increase site preparation and weed control costs, and reduce property values. For example, in Vermont the presence of the aquatic invasive plant Eurasian Watermilfoil (*Myriophyllum spicatum*) depressed shoreline residence property value by as much as 16.4% (Zhang and Boyle, 2010).

Forestry/Agriculture

Invasive plant species which become established in forests will out-compete native species and prevent forest re-generation after logging or natural disturbance. Dog-strangling Vine (*Cynanchum rossicum*) is of particular concern in conifer plantations. This species thrives in the filtered light and open soils of mature plantations, and suppresses seedling establishment of native hardwoods. If its invasion continues, very few juvenile trees will survive to fill the shrinking canopy of over-mature pines. Reforestation sites are also susceptible; the thick mats of vegetation and aggressive competition from Dog-strangling Vine decrease available planting space and increase costs as more mature vegetation needs to be planted in order to ensure the new vegetation can outcompete the invasive plant. As a result, expensive control programs are often required.

Land Management (Trail Use/Maintenance)

Recreational trail use and the maintenance of trails can facilitate the transport of invasive plant material and seeds, and create open and disturbed sites that are prime locations for the establishment of invasive species. Studies have proven that trails act as corridors which assist in the spread of invasive plant species. Humans, their pets, and vehicles such as ATV's can be vectors of invasion along trails because seeds and plant pieces can be carried on equipment and clothing. In addition, frequent trampling along trails alters soil properties, limits the growth of some native species, and creates conditions that may favour the growth of non-native species (Kuss et al. 1985; Marion et al. 1985; Yorks et al. 1997).

Roadsides/Utilities

Invasive species can increase the cost of roadside and utility maintenance by requiring additional maintenance and control efforts. The presence of invasive species can also provide a safety hazard. In the case of Phragmites and Miscanthus (invasive grass species), along with interrupting sight lines, the dead stalks which remain standing each autumn also provide combustible material. Fires in these stands burn intensely, and can damage utilities and hydro lines. Phragmites along roadsides is generally assumed to be spread through the transport and burial of rhizome fragments through ditching, ploughing, and other human activities that transport rhizomes on machinery. Studies have shown that vehicles and road-fill operations can transport invasive plant seeds into uninfested areas, and road construction and maintenance operations provide optimal disturbed sites for seed germination and seedling establishment (Schmidt 1989; Lonsdale & Lane 1994; Greenberg et al. 1997; Trombulak & Frissell 2000).

Steps to Prevent the Unintentional Introduction of Invasive Species from Equipment

Inspection and cleaning of all machinery and equipment should be performed in accordance with the procedures, checklists and diagrams provided in this protocol.

When visiting more than one site, always schedule work in the sites that are the least disturbed and free of known invasive species first, and visit sites with known invasive species infestations last. This will greatly reduce the risk of transferring plants to new locations.

When to Inspect

Inspection should be done before:

- Moving vehicles out of a local area of operation
- Moving machinery between properties or sites within the same property where invasive species may be present in one area, and not in another
- Using machinery along roadsides, in ditches, and along watercourses
- Vehicles using unformed dirt roads, trails or off road conditions
- Using machinery to transport soil and quarry materials
- Visiting remote areas where access by vehicles is limited

Inspection should be done after:

- Operating in areas known to have terrestrial invasive plants or are in high risk areas (i.e. recently disturbed areas near known invaded areas)
- Transporting material (i.e. soil) that is known to contain, or has the potential to contain, invasive species
- Operating in an area or transporting material that you are uncertain contain invasive species
- In the event of rain. If mud contains seeds, they can travel indefinitely until it rains or the road surface is wet, allowing for long distance transport. This may result in transporting seeds to areas where those species did not previously exist

How to Inspect

- Inspect the vehicle thoroughly inside and out for where dirt, plant material and seeds may be lodged or adhering to interior and exterior surfaces.
- Remove any guards, covers or plates that are easy to remove.
- Attention should be paid to the underside of the vehicle, radiators, spare tires, foot wells and bumper bars.

If clods of dirt, seed or other plant material are found, removal should take place immediately, using the techniques outlined below.

When to Clean

Vehicles and heavy equipment that stay on formed and sealed roads have a low risk of spreading invasive species. Cleaning is only required when inspection identifies visible dirt clods and plant material or when moving from one area to another.

Depending on the invasive species present, vehicles may need to be cleaned even when deep snow is present. Phragmites, for example, can still be spread, even in packed snow because the seed heads are usually above the surface of the snow. Other plants, such as Dog-strangling vine, will be contained beneath deep snow.

**Regular inspection of vehicles and machinery will identify if any soil or plant material has been collected on or in vehicles and machinery.*

Where to Clean

Clean the vehicle/equipment in an area where contamination and seed spread is not possible (or limited). The site should be:

- Ideally, mud free, gravel covered or a hard surface. If this option is not available, choose a well maintained (i.e. regularly mowed) grassy area.
- Gently sloping to assist in draining water and material away from the vehicle or equipment. Care should be taken to ensure that localized erosion will not be created, and that water runs back into the area where contamination occurred.
- At least 30m away from any watercourse, water body and natural vegetation.
- Large enough to allow for adequate movement of larger vehicles and equipment.

**Safely locate the vehicle and equipment away from any hazards. If mechanized, ensure engine is off and the vehicle or equipment is immobilized.*

How to Clean Inside

Clean the interior of the vehicle by sweeping, vacuuming or using a compressed air device. Particular attention should be paid to the floor, foot wells, pedals, seats and under the seats.

How to Clean Outside

Knock off all large clods of dirt. Use a pry bar or other device if necessary.

Identify areas that may require cleaning with compressed air rather than water such as radiators and grills. Clean these areas first prior to using water.

Clean the vehicle with a high pressure hose in combination with a stiff brush and/or pry bar to further assist the removal of dirt clods.

Start cleaning from the top of the vehicle and work down to the bottom.

Emphasis should be placed on the undersides, wheels, wheel arches, guards, chassis, engine bays, radiator, grills and other attachments.

When the cleaning is finished avoid driving through the waste water when removing the vehicle or equipment from the cleaning site.

For equipment such as water trucks that may be exposed to aquatic invasive species, trucks should be disinfected with bleach solution before conducting work in a new area. For further information please refer to the Invading Species Awareness Program's Technical Guidelines listed under Contacts and Resources.

Hosing down a vehicle in Queensland Australia
Photo by: TH9 Outdoor Services

Final Inspection Checklist

Conduct a final inspection to ensure the following general clean standard has been achieved:

- No clods of dirt should be visible after wash down.
- Radiators, grills and the interiors of vehicles should be free of accumulations of seed, soil, mud and plant material parts including seeds, roots, flowers, fruit and or stems.

Diagrams have been provided to assist in quickly identifying key areas to inspect and clean on a variety of vehicles associated with the targeted industries. These can be used in combination with vehicle checklists to ensure all areas of the vehicles have been inspected and cleaned.

Equipment Required

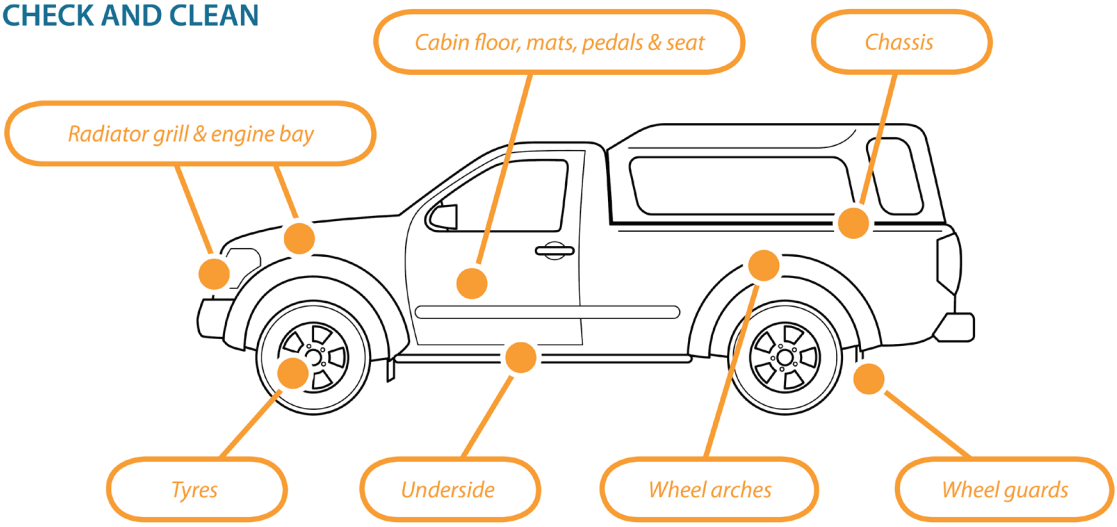
- A pump and high pressure hose OR High pressure water unit
- Minimum water pressure for vehicle cleaning should be at least 90 pounds per square inch. Water can be supplied as high volume/low pressure or low volume/high pressure (NOAA Fisheries Service).
- Air compressor and blower OR Vacuum
- Shovel
- Pry bar
- Stiff brush or broom

Cleaning station at construction site.
Photo by: Mark Heaton, OMNR

Inspection and Cleaning Diagrams and Checklists

2WD and 4WD Vehicles

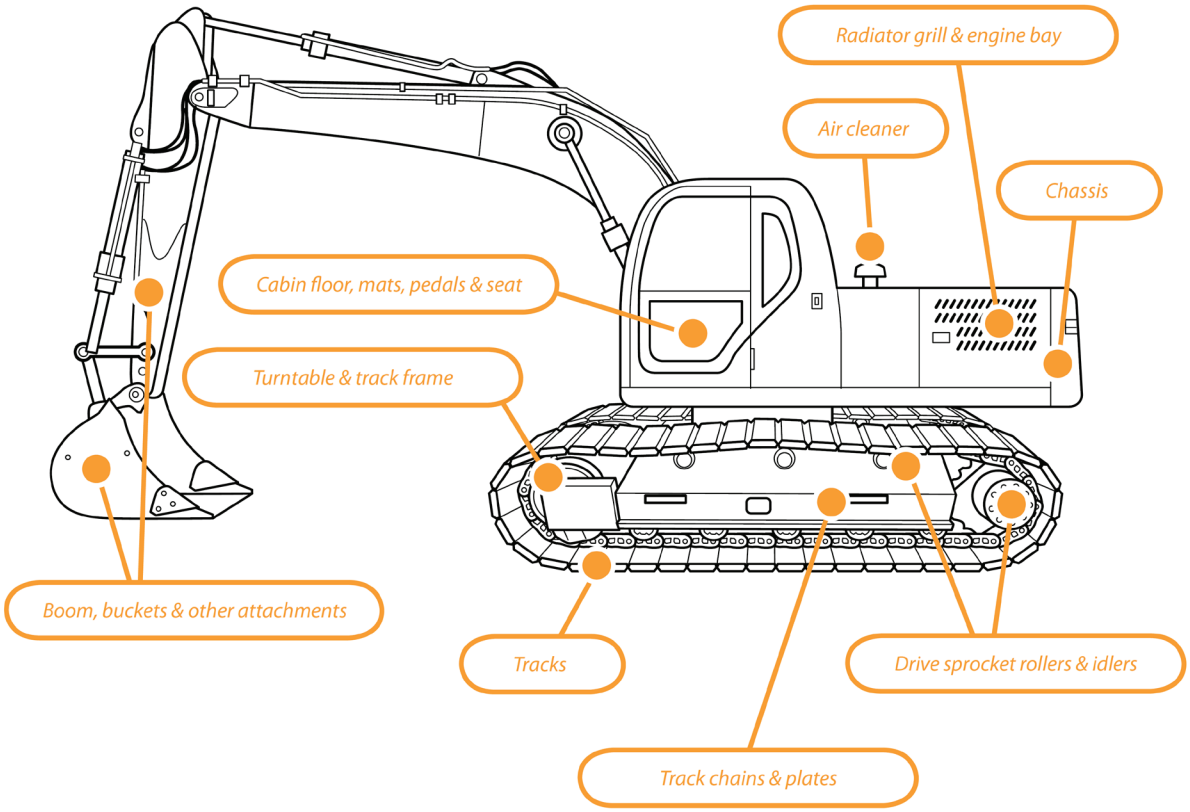
4WD VEHICLE WITH KEY SPOTS TO CHECK AND CLEAN



		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill	
Body	Underside, chassis, crevices, ledges, bumper bars	
Wheels	All wheels (including spare), wheel arches, guards	
Tray	Floor, canopy (if included)	

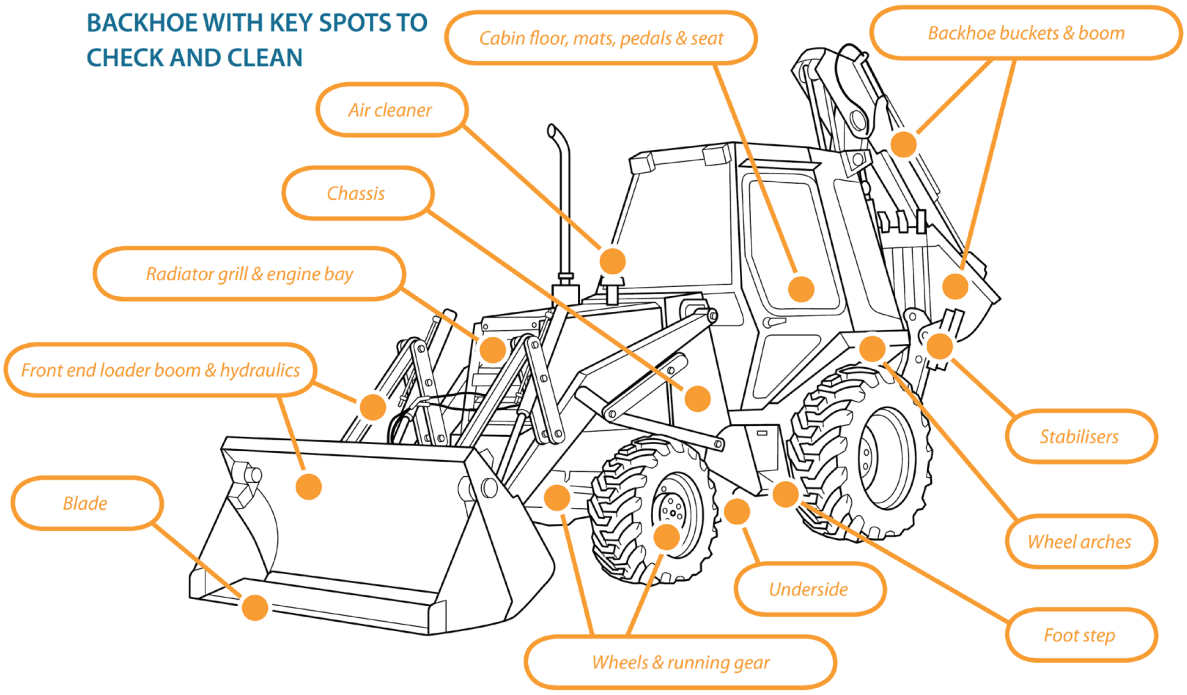
Excavator

EXCAVATOR WITH KEY SPOTS TO CHECK AND CLEAN



		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Plates of cabin	
Body	Ledges, channels	
Bucket		
Booms		
Turret Pivot		

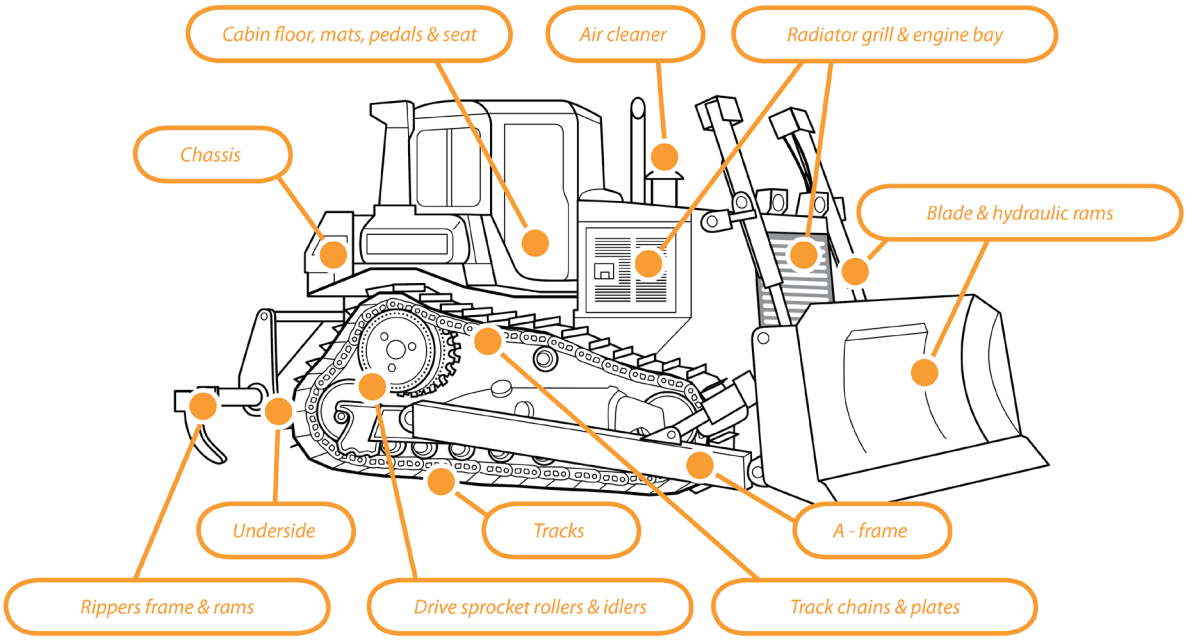
Backhoe



		✓
Cabin	Floor, mats, pedals, seats, foot step	
Engine	Radiators, engine bay, grill, air cleaner	
Wheels	All wheels (including spare), wheel arches, guards	
Front end loader	Blade, hydraulics, booms	
Backhoe	Buckets, boom, hydraulics, stabilizers	

Bulldozer

BULLDOZER WITH KEY SPOTS TO CHECK AND CLEAN



		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Belly plates and rear plates	
Body	Ledges, channels	
Blade	Pivot points, hydraulic rams, a-frame	
Ripper	Ripper frame, ripper points	

Contacts and Resources

Ontario Invasive Species Strategic Plan 2012. Government of Ontario. Online, accessed May 8, 2012.
http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@biodiversity/documents/document/stdprod_097634.pdf

Invasive Species Management for Infrastructure Managers and the Construction Industry 2008. Wade, M. Booy, O. and White, V. Online, accessed April 27, 2012
http://www.ciria.org/service/Web_Site/AM/ContentManagerNet/ContentDisplay.aspx?Section=Web_Site&ContentID=9001

T.I.P.S (Targeted Invasive Plant Solutions) Highway Operations. British Columbia Invasive Species Council. Online, accessed May 8, 2012
http://www.bcinvasiveplants.com/iscbc/publications/TIPS/Highways_Operations_TIPS.pdf

Invading Species Awareness Program Workshop Manual: Aquatic Invasive Species: An Introduction to Identification, Collection and Reporting of Aquatic Invasive Species in Ontario Waters (includes information on decontaminating equipment).
http://www.invadingspecies.com/download/publications/manuals/WorkshopManual.pdf

Reporting Invasive Species

To report invasive species, or view maps of existing records, visit the Invading Species Awareness Program website www.invadingspecies.com/report/ or www.eddmaps.org/Ontario.

Or call the OFAH/MNR Invading Species Awareness Program Hotline at **1-800-563-7711**

Acknowledgements

We gratefully acknowledge NRM South (Tasmania, Australia) for allowing the use of their artwork and text from their "Keeping it Clean – A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens".

We also sincerely thank the Clean Equipment Protocol Working Group and the Ontario Invasive Plant Council Committees and Board of Directors for their ongoing support and valuable input into this document, and the Canada-Ontario Invasive Species Centre and Ontario Ministry of Natural Resources for the support in creating this protocol.

Clean Equipment Protocol Working Group:

Diana Shermet, Central Lake Ontario Conservation Authority; Paula Berketo, Ontario Ministry of Transportation; Travis Cameron, Ontario Ministry of Natural Resources; Jennifer Hoare, Ontario Parks; Michael Irvine, Ontario Ministry of Natural Resources; Alison Kirkpatrick, OFAH/MNR Invading Species Awareness Program; Erika Weisz, Ontario Ministry of Natural Resources; Amanda Chad, Ontario Power Generation; Nancy Vidler, Lambton Shores Phragmites Community Group; Nigel Buffone, Du Pont Canada Company; Ewa Bednarczuk, Lower Trent Conservation Authority

We also gratefully acknowledge the input and direction from Francine MacDonald, James Rockwood, Anne-Marie Roussy, Stephen Smith, Caroline Mach, Patricia Lowe, John Bowen, Karen Hartley, and the Southern Ontario Community Forest Managers group.

More Information:

Ontario Invasive Plant Council: www.ontarioinvasiveplants.ca

Appendix A: Identification of Invasive Plants found in Ontario

- **Common Buckthorn** (*Rhamnus cathartica*) and **Glossy Buckthorn** (*Frangula alnus*)
- **Dog-strangling Vine** (*Cynanchum rossicum*)
- **Garlic Mustard** (*Alliaria petiolata*)
- **Japanese Knotweed** (*Polygonum cuspidatum*)
- **Phragmites or Common Reed** (*Phragmites australis subsp. australis*)
- **Giant Hogweed** (*Heracleum mantegazzianum*)

common & glossy buckthorn

(Rhamnus cathartica & R. frangula)

Plant type: Shrub/small tree

Arrangement: Common buckthorn are sub-opposite (almost opposite). Glossy buckthorn are alternate.

Leaf: The common buckthorn leaf is egg shaped, edge of the leaf is "pebbled" (small rounded teeth). Veins converging toward leaf top. The glossy buckthorn leaf is more slender (tear drop shaped) and smooth margined.

Bark: Smooth, young bark with prominent raised patches or lenticels; rough texture and peeling bark when mature.

Seed/Flowers: Flowers are green-yellowish, small and inconspicuous. Green berries becoming purplish/black in late summer, berry > 1 cm in diameter.

Buds/Twigs: Common buckthorn has thorn-like tip on many twigs. Glossy buckthorn buds have no bud scales and lack thorny tips to twigs.

Habitat: Various - forest, thickets, meadows, dry to moist soils.

Similar native species: Native dogwoods, which lack the thorny "tip". Native dogwoods are truly opposite in arrangement of twigs; only alternate leaved (pagoda) dogwood has alternate branching.

dog-strangling vine
(Cynanchum rossicum & C. nigrum)

Plant type: Herb, twining vine

Arrangement: Opposite

Leaf: Lance shaped, smooth margin (edge)

Bark: n/a

Seed/Flowers: Bean shaped seed pod with seeds attached to downy 'umbrellas'. Flowers - pink (C. rossicum) or purple (C. nigrum) with five petals.

Buds/Twigs: n/a

Habitat: Dry to moist soils; more dominant in meadows and woodland edges.

Similar native species: Swamp milkweed (Asclepias incarnata spp.), is an upright plant, typically found in wetland habitats.

garlic mustard
(Alliaria petiolata)

Plant type: Herb

Arrangement: Alternate

Leaf: Saw tooth like edge, elongated heart shape. Garlic/onion smell when crushed. Leaves are kidney shaped with prominent veins.

Bark: n/a

Seed/Flowers: Cluster of small white flowers with four petals. Small black < 1 mm rounded seed found in elongated 'tube-like' seed pods (similar to a bean pod).

Buds/Twigs: n/a

Habitat: Various – dry to moist soils, in all habitat types, less often in meadows.

Similar native species: n/a

japanese knotweed
(Polygonum cuspidatum)



Plant type: Herb, 2 - 4 m in height.

Arrangement: Alternate

Leaf: Tear drop shaped, sharp pointed, dark green, flattened at base.

Bark: n/a

Seed/Flowers: Flowering stalk of many small greenish-white flowers.

Buds/Twigs: Large plant with a 'bamboo-like' stem. Stem light green maturing to tan colour.

Habitat: Moist to wet soils found in wetlands, water-courses and roadside ditches.

Similar native species: None.

common reed
(Phragmites australis)



Plant type: Grass

Arrangement: Alternate

Leaf: Broad leaf > 1 cm wide.

Bark: n/a

Seed/Flowers: Dense cascading 'broom-like' flower head. 'Cottony' in appearance when mature.

Buds/Twigs: Stems rough and ridged, ligule a densely hairy band. Mature plants > 3 m tall.

Habitat: Moist to wet soils. Found in wetlands, water- courses and road side ditches.

Similar native species: Species of mannagrass (Glyceria sp) including tall northern, eastern and rattlesnake grass. A native common reed exists but has a smooth stem and the ligule is not hairy. It is also quite rare.

giant hogweed
(Heracleum mantegazzianum)

Plant type: Herb. Mature plants can be over 3m tall.

Arrangement: Alternate

Leaf: Lobed leaf 1-2 m wide, lobes sharp-pointed.

Bark: n/a

Seed/Flowers: Small, white flowers in a large umbrella-shaped cluster, .75 m wide.

Buds/Twigs: Hairy stem with purple spots.

Habitat: Fresh to wet soils in forests, swamps, meadows, marshes.

Similar native species: Cow parsnip *(Heracleum maximum)* – has smaller flowers, no purple spots on stems.Angelica (Angelica atropurpurea) has a rounded-topped flower cluster and leaves divided into many leaflets.

Do not touch this plant because it is poisonous. If you do, wash your skin immediately in cool soapy water and do not expose the area to sunlight.

Seek professional advice before removing.

Identification of Invasive Plants found in Ontario Photos by:

Credit Valley Conservation, Greg Bales, Ken Towle, Patrick Hodge,
Ontario Federation of Anglers and Hunters, Francine Macdonald, Matt Smith

Ontario
Invasive Plant Council

APPENDIX B – ARCHAEOLOGICAL ASSESSMENT REPORT

STAGE 1 AND 2
ARCHAEOLOGICAL ASSESSMENTS FOR ROUTE 800 REALIGNMENT AT BUTTERNUT CREEK MCEA
PART OF LOT 9, CONCESSION 8
GEOGRAPHIC TOWNSHIP OF CAMBRIDGE
NOW THE MUNICIPALITY OF THE NATION
UNITED COUNTIES OF PRESCOTT AND RUSSELL

DRAFT

Past Recovery
Archaeological Services Inc.

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENTS FOR ROUTE 800 REALIGNMENT AT BUTTERNUT CREEK MCEA, PART OF LOT 9, CONCESSION 8, GEOGRAPHIC TOWNSHIP OF CAMBRIDGE, NOW THE MUNICIPALITY OF THE NATION, UNITED COUNTIES OF PRESCOTT AND RUSSELL

Prepared for: Ms. Lisa Marshall, P.Eng.
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Re: *Municipal Class Environmental Assessment*

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Project No.: PR21-022

Licensee: Stephanie Cleland, M.A., Licence P1201
Staff Archaeologist
Past Recovery Archaeological Services Inc.

P.I.F. No.: P1201-0129-2022

Date: May 10th, 2022 Original Report

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Ms. Lisa Marshall, P.Eng., Manager, Environmental Engineering, McIntosh Perry Consulting Engineers Ltd., provided project mapping and logistical assistance.

PROJECT PERSONNEL

Licence Holder	Stephanie Cleland, M.A. (P1201)
Historical Research	Gabryell Kurtzrock Belyea, M.A. (R1195)
Field Director	Gabryell Kurtzrock Belyea
Stage 2 Field Crew	Liam Bowman, B.A.
	Trevor Hockney, B.A.
	Morgan Ward, B.A.
Report Writing	Gabryell Kurtzrock Belyea
Report GIS	Gabryell Kurtzrock Belyea
Report Review	Jeff Earl, M.Soc.Sc.

EXECUTIVE SUMMARY

Past Recovery Archaeological Services Inc. was retained by McIntosh Perry Consulting Engineers Ltd., on behalf of the Nation Municipality, to undertake Stage 1 and Stage 2 archaeological assessments as part of planned improvements to Route 800. The subject property was located on part of Lot 9, Concession 8 of the geographic Township of Cambridge, now the Municipality of The Nation, United Counties of Prescott and Russell (see Maps 1 and 2). The area covered by the proposed road improvements was approximately 2.8 hectares (or 7 acres) in size.

The purpose of the Stage 1 investigation was to evaluate the archaeological potential of the study area and present recommendations for the mitigation of any significant known or potential archaeological resources. To this end, historical, environmental and archaeological research was conducted in order to make a determination of archaeological potential. The results of this study indicated that portions of the subject property possessed potential for pre-Contact and post-Contact archaeological resources.

The purpose of the Stage 2 assessment was to determine whether the property contained archaeological resources requiring further assessment, and if so to recommend an appropriate Stage 3 assessment strategy. The assessment was completed over the course of one day: April 20th, 2022 (see Map 7). Given that the study area was comprised of an active agricultural field, small wooded areas, and road rights-of-way, the assessment was conducted by means of a combination of shovel test pit survey at five metre intervals and pedestrian survey at five metre intervals across all portions of the study area determined to exhibit archaeological potential. No archaeological resources were recovered as part of the Stage 2 assessment.

The results of the property survey documented in this report form the basis for the following recommendations:

1) As the Stage 2 property survey did not result in the identification of any archaeological sites requiring further assessment or mitigation of impacts, no further archaeological assessment of the study area as defined on Map 2 is required.

2) In the event that future planning results in the identification of additional areas of impact beyond the limits of the present Stage 2 study area, further archaeological assessment may be required. It should be noted that screening for impacts should include all aspects of the proposed development that may cause soil disturbances or other alterations, and that that even temporary property needs should be considered. Any additional archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011).

The reader is also referred to Section 7.0 below to ensure compliance with relevant provincial legislation and regulations as may relate to this project.

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1.0 INTRODUCTION

Past Recovery Archaeological Services Inc. (Past Recovery) was retained by McIntosh Perry Consulting Engineers Ltd., on behalf of The Nation municipality, to undertake Stage 1 and 2 archaeological assessments in support of proposed improvements to Route 800 as per requirements of a *Municipal Class Environmental Assessment*. The subject property was located on part of Lot 9, Concession 8 of the geographic Township of Cambridge, now the Municipality of The Nation, United Counties of Prescott and Russell (Maps 1 and 2).

The objectives of the Stage 1 archaeological assessment were as follows:

- To provide information concerning the geography, history, previous archaeological fieldwork and current land condition of the study area;
- To evaluate the potential for the subject property to contain significant archaeological resources; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment in the event further assessment is warranted.

The objectives of the Stage 2 archaeological assessment were as follows:

- To document all archaeological resources on the property;
- To determine whether the property contains archaeological resources requiring further assessment; and,
- In the event that an archaeological site requiring further assessment is discovered, to recommend an appropriate Stage 3 assessment strategy.

2.0 PROJECT CONTEXT

This section of the report provides the context for the archaeological work undertaken, including a description of the study area, the related legislation or directives triggering the assessment, any additional development-related information, the confirmation of permission to access the study area for the purposes of the assessment, and Indigenous territorial acknowledgement.

2.1 Property Description

The subject property was located within part of Lot 9, Concession 8 of the geographic Township of Cambridge, now the Municipality of The Nation, United Counties of Prescott and Russell, and consisted of 2.8 hectares (7 acres) of land containing an active farm field and road rights-of-way (see Maps 1 and 2). The property was irregularly shaped and generally followed the contours of Butternut Creek between County Road 7 and Paul Latour Road (Route 800). The study area was mostly located in the southwestern corner of an active agricultural field on the eastern half of Lot 9, Concession 8. It also comprised parts of the rights-of-way associated with County Road 7 and Paul Latour Road (Route 800).

2.2 Development Context

McIntosh Perry Consulting Engineers Ltd. is preparing a Municipal Class Environmental Assessment on behalf of the proponent, The Nation Municipality, in advance of a proposed alteration to Route 800 to avoid crossing Butternut Creek. Archaeological assessment was required as part of the environmental assesssment, and Past Recovery was retained to complete this work. As noted above, the Stage 1 study area consisted of a 2.8 hectare (7 acre) parcel. All Stage 2 work was confined to the lands to be included in the road realignment and adjustments to the existing road segments that will no longer be in use.

2.3 Access Permission

Permission to access the subject property and complete all aspects of the archaeological assessment, including photography and the collection of artifacts, was granted by the Nation Municipality and the current owner of the agricultural field.

2.4 Territorial Acknowledgement

The study area falls within the traditional territory of the Anishinaabeg and forms part of the Algonquins of Ontario (AOO) Settlement Area set out by the current Agreement-in-Principle between the AOO and the federal and provincial governments, signed in 2016.[1]

[1] The Algonquins of Ontario are composed of ten communities: The Algonquins of Pikwakanagan First Nation, Antoine, Kijicho Manito Madaouskarini (Bancroft), Bonnechere, Greater Golden Lake, Mattawa/North Bay, Ottawa, Shabot Obaadjiwan (Sharbot Lake), Snimikobi (Ardoch), Whitney and Area. Federally unrecognized Algonquin communities, including Ardoch First Nation, also live in the territory but do not form part of the AOO (see Lawrence 2012). The Agreement-In-Principle is between the Algonquins of Ontario and the Governments of Ontario and Canada. Algonquins have sought recognition and protection of their traditional territory dating back to 1772 and in 1983 the Algonquins of Pikwàkanagàn First Nation (previously Algonquins of Golden Lake) formally submitted a petition to the Government of Canada, and in 1985 to the Government of Ontario. The claim was accepted for negotiations in 1991 and 1992, an Agreement-In-Principle was signed in 2016, and negotiations are on-going. For further information see www.tanakiwin.com.

3.0 HISTORICAL CONTEXT

This section of the report is comprised of an overview of human settlement in the region using information derived from background historical research. The purpose of this research is to describe the known settlement history of the local area, with the intention of providing a context for the evaluation of known and potential archaeological sites, as well as a review of property-specific information presenting a record of settlement and land use history.

3.1 Regional Pre-Contact Cultural Overview

While our understanding of the pre-Contact sequence of human activity in the region is limited, it is possible to provide a general outline of pre-Contact occupation based on archaeological, historical, and environmental research conducted across what is now eastern Ontario.[2] Archaeologists divide the long sequence of Indigenous occupation into both temporal periods and regional groups based primarily on the presence and/or style of various surviving artifact types within the archaeological record. While this provides a means of discussing the past, it is an archaeological construct and interpretation; it does not reflect the generally gradual nature of change over time, nor the complexities of interactions between different Indigenous groups. Archaeology is not a substitute for Indigenous world views and histories as detailed in the oral traditions of Indigenous communities who have long-standing relationships with the land. The following summary uses the generally accepted archaeological chronology for the pre-Contact period while recognizing its limitations.

Across the region, glaciers began to retreat around 15,000 years ago (Munson 2013:1). The earliest human occupation of Ontario began approximately 13,500 years before present (B.P.) with the arrival of small groups of hunter-gatherers referred to by archaeologists as Palaeo-Indians (Ellis 2013:35). These groups gradually moved northward as the glaciers and glacial lakes retreated. While very little is known about their lifestyle, it is likely that Palaeo-Indian groups travelled widely relying on the seasonal migration of caribou as well as small animals and wild plants for subsistence in a sub-arctic environment. They produced a variety of distinctive stone tools including fluted projectile points, scrapers, burins and gravers. Their sites are rare, and most are quite small (Ellis 2013:35-36). Palaeo-Indian peoples tended to camp along shorelines, and because of the changing environment, many of these areas are now inland. Indigenous settlement of much of eastern Ontario was late in comparison to other parts of Ontario as a result of the high-water levels associated with glacial Lake Algonquin, the early stages of glacial Lake Iroquois and the St. Lawrence Marine Embayment of the post-glacial Champlain Sea (Hough 1958:204). In eastern Ontario, the old shoreline ridges of

[2] Current common place names are used throughout this report while recognizing that the many Indigenous peoples who have lived in the region for thousands of years had, and often maintain, their own names for these places and natural features.

Lake Algonquin, Lake Iroquois, the Champlain Sea and of the emergent St. Lawrence and Ottawa river channels and their tributaries would be the most likely areas to find evidence of Palaeo-Indian occupation (see AOO 2017; Ellis 2013; Ellis and Deller 1990; Watson 1999).

During the succeeding Archaic period (c. 10,000 to c. 3,000 B.P.), the environment of the region approached modern conditions and more land became available for habitation as water levels in the glacial lakes dropped. Populations continued to follow a mobile hunter-gatherer subsistence strategy, although there appears to have been a greater reliance on fishing and gathered food (e.g. plants and nuts) and more diversity between regional groups. The tool kit became increasingly diversified with the introduction of ground stone tools and with a general reduction in the size of flaked stone projectile points. Both technological changes signal past adaptations to environmental conditions more similar to those of today. Tools made from ground stone included axes, adzes, gouges and other implements believed to have been used for the construction of dug-out canoes, grinding stones for processing nuts and seeds, and specialized net sinkers and plummets for fishing. A wide variety of non-utilitarian items such as gorgets, pipes and 'birdstones' were also manufactured from ground stone, and speak to ceremonialism in life and increasingly elaborate burial practices in death. The middle and late portions of the Archaic period saw the development of trading networks spanning the Great Lakes, and by 6,000 years ago copper was being mined in the Upper Great Lakes and traded into southern Ontario. By the end of this period populations had increased substantially over the preceding Palaeo-Indian occupation (Ellis 2013; Ellis et al. 1990).

More extensive Indigenous settlement of the Eastern Ontario region began during this period, sometime between 7,500 and 6,500 B.P. Artifacts from Archaic sites suggest a close relationship between these communities and what archaeologists refer to as the Laurentian Archaic stage peoples who occupied the Canadian biotic province transition zone between the deciduous forests to the south and the boreal forests to the north. This region included northern New York State, the upper St. Lawrence Valley across southern Ontario and Quebec, and the state of Vermont (Ritchie 1969; Clermont et al. 2003). The 'tradition' associated with this period is characterized by a more or less systematic sharing of several technological features, including large, broad-bladed, chipped stone and ground slate projectile points, and heavy ground stone tools. This stage is also known for the extensive use of cold-hammered copper tools including "*bevelled spear points, bracelets, pendants, axes, fishhooks and knives*" (Kennedy 1970:59). The sharing of this set of features is generally perceived as a marker of historical relatedness and inclusion in the same interaction network (Clermont et al. 2003). Cemeteries also appear for the first time during the Late Archaic. Evidence of Archaic occupation has been found across eastern Ontario (see Clermont 1999; Clermont et al. 2003; Ellis 2013; Kennedy 1962, 1970; Laliberté 2000; Watson 1990).

Archaeologists use the appearance of ceramics in the archaeological record to mark the beginning of the Woodland period (c. 3,000 B.P. to c. 350 B.P.). Ceramic styles and

decorations suggest the continued differentiation between regional populations and are commonly used to distinguish between three periods: Early Woodland (2,900 to 2,300 B.P.), Middle Woodland (2,300 to 1,200 B.P.), and Late Woodland (1,200 to 400 B.P.). The introduction of ceramics to southern Ontario does not appear to have been associated with significant changes to lifeways, as hunting and gathering remained the primary subsistence strategy throughout the Early Woodland and well into the Middle Woodland. It does, however, appear that regional populations continued to grow in size, and communities continued to participate in extensive trade networks that, at their zenith c. 1,750 B.P., spanned much of the continent and included the movement of conch shell, fossilized shark teeth, mica, copper and silver; a large number of other items that rarely survive in the archaeological record would also have been exchanged, as well as knowledge.[3] Social structure appears to have become increasingly complex, with some status differentiation evident in burials. In southeastern Ontario, the first peoples to adopt ceramics are identified by archaeologists as belonging to the Meadowood Complex, characterized by distinctive biface preforms, side-notched points, and Vinette I ceramics which are typically crude, thick, cone-shaped vessels made with coils of clay shaped by cord-wrapped paddles. Meadowood material has been found on sites across southern Ontario extending into southern Quebec and New York State (Fox 1990; Spence et al. 1990).

In the Middle Woodland period, increasingly distinctive trends or 'traditions' continued to evolve in different parts of Ontario (Spence et al. 1990). Although regional patterns are poorly understood and there may be distinctive traditions associated with different watersheds, the appearance of improved (thinner-walled and containing finer grit temper) ceramic vessels decorated with dentate or pseudo-scallop impressions have been used by archaeologists to distinguish the Point Peninsula Complex. These ceramics are identified as Vinette II and are typically found in association with evidence of distinct bone and stone tool industries. Sites exhibiting these traits are known from throughout south-central and eastern Ontario, northern New York, and northwestern Vermont, and are often found overlying earlier occupations. Some groups appear to have practiced elaborate burial ceremonialism that involved the construction of large earthen mortuary mounds and the inclusion of numerous and often exotic materials in burials, construed as evidence of influences from northern Ontario and the Hopewell area to the south in the Ohio River valley. Investigations of sites with occupations dating to this time period have allowed archaeologists to develop a better picture of the seasonal round followed in order to harvest a variety of resources within a home territory. Through the late fall and winter, small groups would occupy an inland 'family' hunting area. In the spring, these dispersed families congregated at specific lakeshore sites to fish, hunt in the surrounding forest and socialize. This gathering would last through to the late summer

[3] For example, the recent discovery of a cache of charred quinoa seeds, dating to 3,000 B.P. at a site in Brantford, Ontario, indicates that crops were part of this extensive exchange network, which in this case travelled from the Kentucky-Tennessee region of the United States. Thus far, there is no indication that these seeds were locally grown (Crawford et al. 2019).

when large quantities of food would be stored up for the approaching winter (Spence et al. 1990).

Towards the end of the Middle Woodland period (1200 B.P.), groups living in southern Ontario included horticulture in their subsistence strategy. Available archaeological evidence, which comes primarily from the vicinity of the Grand and Credit rivers, suggests that this development was not initially widespread. The adoption of maize horticulture instead appears to be linked to the emergence of the Princess Point Complex which is characterized by decorated ceramics combining cord roughening, impressed lines, and punctate designs; triangular projectile points; T-based drills; steatite and ceramic pipes; and ground stone chisels and adzes (Fox 1990). The distinctive artifacts and horticultural practices have led to the suggestion that these populations were ancestral to the Iroquoian-speaking peoples who later inhabited southern Ontario (Warrick 2000:427).[4]

Archaeologists have distinguished the Late Woodland period by the widespread adoption of maize horticulture by some Indigenous groups primarily across much of southern Ontario and portions of the southeast with favourable soils. The cultivation of corn, beans, squash, sunflowers and tobacco radically altered subsistence strategies and gained economic importance in the region over time. This change is associated with increased sedentarism, and with larger and more dense settlements focused on areas of easily tillable farmland. In some areas, semi-permanent villages with communal 'longhouse' dwellings appeared for the first time. These villages were occupied year-round for 12 to 20 years until local firewood and soil fertility had been exhausted. Many were surrounded by defensive palisades, evidence of growing hostilities between neighbouring groups. Associated with these sites is a burial pattern of individual graves occurring within the village. Upon abandonment, the people of one or more villages often exhumed the remains of their dead for reburial in a large communal burial pit or ossuary outside of the village(s) (Birch and Williamson 2013; Wright 1966). More temporary habitations such as small hamlets, agricultural cabin sites, and hunting and fishing camps were also used. Throughout much of eastern Ontario, however, the shield-like terrain limited the adoption of extensive horticulture and Indigenous groups continued to move frequently across this territory hunting, fishing, and gathering (Pilon 1999).

[4] There have been several studies, however, that indicate assigning ethnicity to archaeological sites based on ceramic typologies and other kinds of artifacts is problematic (see Hart and Englebrecht 2012; Kapyrka 2017). For instance, Iroquoian-style pottery is found on sites within traditional Anishinaabe territories in eastern New York and Ontario (Hart and Englebrecht 2012: 335, 345). Further, artifact traits associated with particular ethnicities are not always agreed upon by archaeologists and in many cases these traits indicate the presence of more than one group (Fox and Garrad 2004). Though valuable "*in terms of the history of archaeological thought*," equating an Indigenous artifact trait with ethnicity is overly simplistic and lacking any means for evaluation, exemplifying the importance of other lines of evidence, including oral histories, in an interpretive historical framework (Kapyrka 2017).

At the end of the Late Woodland period several Indigenous groups were living within eastern Ontario, although the territories associated with each and the relationships between them were complex and are not fully understood. Anishinaabe oral histories suggest a broad homeland extending far to the west of Ontario and include references to a migration from the Atlantic seaboard, as well as a subsequent return via the St. Lawrence River to the Great Lakes region, with the latter having occurred around 500 B.P. (Hessel 1993; Sherman 2015:27). Those who became known as the Algonquin[5] settled along the Ottawa River or Kichi-Sibi[6] and its tributaries in eastern Ontario and western Quebec; the Ojibwa and Nipissing were located further to the north and west. Living on and around the Canadian Shield, all Anishinaabeg maintained a more nomadic lifestyle than their agricultural neighbours to the south, and accordingly their presence is less visible in the archaeological record (Morrison 2005; Sherman 2015:28).

The so-called St. Lawrence Iroquoians inhabited the St. Lawrence River valley from the east end of Lake Ontario to the Quebec City region and beyond, and have been identified archaeologically based on a distinctive material culture, a horticulture-based subsistence supplemented with fishing, hunting and gathering, and the presence of large semi-permanent villages as well as smaller camps. Numerous discrete settlement clusters have been identified across this vast territory; however, the political and social relationships between these populations is unclear (Tremblay 2006). In eastern Ontario, significant St. Lawrence Iroquoian site clusters have been identified near the Spencerville/Prescott area, and just north of Lake St. Francis (sometimes referred to as the 'Cornwall Cluster'; Tremblay 2006). The material culture and settlement patterns of the fourteenth and fifteenth century Iroquoian sites found along the upper St. Lawrence in Ontario are directly related to the Iroquoian-speaking groups that Jacques Cartier and his crew encountered in A.D. 1535 at Stadacona (Quebec City) and Hochelaga (Montreal Island; Jamieson 1990:386; Tremblay 2006). By the late sixteenth century, however, all of the St. Lawrence Iroquoian settlements appear to have been abandoned. There are various hypotheses for the 'disappearance' of the St. Lawrence Iroquoians, although increasing hostilities with neighbouring populations, notably the Mohawk, is the most widely accepted (Tremblay 2006). At the time of their 'disappearance,' there was a significant increase in St. Lawrence Iroquoian ceramic vessel types on ancestral Huron-Wendat sites and also on some Algonquin sites, suggesting segments of the St. Lawrence Iroquoian population relocated to other regions as captives or refugees (Birch 2015:291; Sutton 1990:54; Tremblay 2006).

[5] The Algonquin of eastern Ontario increasingly use the Anishinaabemowin word Omàmiwinini to refer to themselves. Omàmiwinini describes the relationship with the land in the language, and though it was largely replaced by 'Algonquin' for many years, efforts are underway to reintroduce the term (Sherman 2008:77).

[6] The Algonquin have various names specific to each part of the Ottawa River. The lower part of the river from Mattawa down to Lake of Two Mountains is traditionally known as the Kichi-Sibi, also spelled Kiji Sibi, Kichisipi, Kichissippi, and Kichisippi (AOO 2020; Morrison 2005:9; Sherman 2015:27).

Agricultural villages of ancestral Huron-Wendat have been recorded along the north shore of Lake Ontario and up the Trent River dating to c. 550 B.P. By c. 450 B.P., the easternmost settlements of the ancestral Huron-Wendat were located between Balsam Lake and Lake Simcoe in the region that would become historic Huronia. This population movement is not fully understood, and undoubtedly involved complex interactions between different cultural groups including the Anishinaabeg and, as noted above, may also have included St. Lawrence Iroquoians. As such, there are conflicting interpretations of the archaeological and historical records related to this period (see Gaudreau and Lesage 2016; Gitiga Migizi 2018; Gitiga Migizi and Kapyrka 2015; Lainey 2006; Richard 2016; Pendergast 1972).

Finally, while the Iroquois or Haudenosaunee[7] homeland was initially south of Ontario in New York state, their oral histories suggest their hunting grounds extended along the north shore of Lake Ontario and the St. Lawrence River into southeastern Ontario and Quebec (Hill 2017). Archaeological data indicates some Haudenosaunee were living year-round in Ontario by the early seventeenth century (Konrad 1981).

The Indigenous population shifts and relationships of the late sixteenth and early seventeenth centuries through the period of initial contact with Europeans were complex and are not fully understood. They were, in part, a result of the disruption of traditional Indigenous exchange patterns brought about by the arrival of the French, Dutch and British along the Atlantic seaboard and the subsequent emergence of the lucrative St. Lawrence River trade route.

3.2 Regional Post-Contact Cultural Overview

The first Europeans to travel into eastern Ontario arrived in the early seventeenth century; predominantly French, they included explorers, fur traders and missionaries. While exploring eastern Ontario and the Ottawa River watershed between c. 1610 and 1613,[8] Samuel de Champlain and others documented encounters with different Indigenous groups speaking Anishinaabemowin, including the Matouweskarini along the Madawaska River, the Kichesipirini at Morrison Island on the Ottawa River, the Otaguottouemin along the river northwest of Morrison Island, the Weskarini in the Petite

[7] Sometime between A.D. 1142 and A.D. 1451 the Mohawk, Oneida, Onondaga, Cayuga, and Seneca united to form the Haudenosaunee Confederacy, also known as the League of Five Nations, and called the Iroquois by the French. When the Tuscarora Nation joined the confederacy in 1722, it became the League of Six Nations.

[8] From this section onwards all dates are presented as A.D.

Nation River basin,[9] and the Onontchataronon[10] living in the South Nation River basin as far west as the Gananoque River basin (Hanewich 2009; Hessel 1993; Sherman 2015:29). These extended family communities subsisted by hunting, fishing, and gathering, and undertook some horticulture (see also Pendergast 1999; Trigger 1987). The Anishinaabeg living in the Upper Ottawa Valley and northward towards the headwaters of the Ottawa River included the Nipissing, Timiskaming, Abitibi (Wahgoshig), and others; however, as the French moved inland, they referred to all these groups who spoke different dialects of Anishinaabemowin as Algonquin (Morrison 2005:18).

At the time of Champlain's travels, the Algonquin were already acting as brokers in the fur trade and exacting tolls from those using the Ottawa River trade route which connected the Upper Great Lakes to the west via Lake Nipissing and Georgian Bay, and the St. Maurice and Saguenay via the Rivières des Outaouais (the portion of the Ottawa River extending eastward into Quebec from Lake Timiskaming). These northern exchange routes circumvented the St. Lawrence River and lower Great Lakes waterways and, therefore, potential conflict with the Haudenosaunee (Joan Holmes & Associates Inc. 1993:2-3). As access to the more southerly route and the extent of settlement in the region fluctuated with the state of hostilities (Joan Holmes & Associates Inc. 1993:3), and given that the fur trade in New France was based in Montreal, the Ottawa River navigation routes were of especial strategic importance in the movement of goods inland and the return of furs down to Montreal. In the wake of Champlain's travels, the Ottawa River became the principal route to the interior for the French. The recovery of European trade goods (e.g., iron axes, copper kettle pieces, glass beads, etc.) from sites throughout the Ottawa River drainage basin provides some evidence of the extent of interaction between Indigenous groups and the French during this period (Kennedy 1970).

With Contact, major population disruptions were brought about by the introduction of European diseases against which Indigenous populations had little resistance; severe smallpox epidemics in 1623-24 and again between 1634 and 1640 resulted in drastic population decline among all Indigenous peoples living in the Great Lakes region (Konrad 1981). The expansion of hunting for trade with Europeans also accelerated decline in the beaver population, such that by the middle of the seventeenth century the centre of the fur trade had shifted northward from what became the northeastern states into southern Ontario. The French, allied with the Huron-Wendat, the Petun, and the Anishinaabeg, refused advances by the Haudenosaunee to trade with them directly. Seeking to expand their territory and disrupt the French fur trade, the Haudenosaunee

[9] The Petite Nation River is in Quebec, with its mouth on the north side of the Ottawa River between Ottawa and Hawkesbury. It is sometimes confused with the South Nation River in eastern Ontario which empties into the south side of the Ottawa River opposite the Petite Nation River. Consequently, the Weskarini territory is sometimes associated with the South Nation River, but this appears to be an error (*cf.* Hessel 1993).

[10] This is a Haudenosaunee term and is, therefore, thought to refer to an Algonquin community that adopted displaced Iroquoians from territory along the St. Lawrence River near Montreal (Fox and Pilon 2016).

launched raids into the region and established a series of winter hunting bases and trading settlements near the mouths of the major rivers flowing into the north shore of Lake Ontario and the St. Lawrence River.[11] The first recorded Haudenosaunee settlements were two Cayuga villages established at the northeastern end of Lake Ontario (Konrad 1981). Between 1640 and 1650, the success of the Haudenosaunee Confederacy in warfare led to the dispersal of the Anishinaabeg and Huron-Wendat who had been occupying much of southern Ontario.

Fort Frontenac was established by the French at the present site of Kingston in 1673, and another fort was constructed at La Presentation (Ogdensburg, New York) in 1700. These forts served to solidify control of the fur trade and to enhance French ties with local Indigenous populations. To this end, the French also encouraged the establishment of Indigenous villages near their settlements (Adams 1986). The full extent of Indigenous settlement in eastern Ontario through to the end of the seventeenth century, however, is uncertain. The Odawa appear to have been using the Ottawa River for trade from c. 1654 onward and some Algonquin remained within the area under French influence, possibly having withdrawn to the headwaters of various tributaries in the watershed. In 1677 the Sulpician Mission of the Mountain was established near Montreal where the Ottawa River empties into the St. Lawrence River. While it was mostly a Mohawk community that became known as Kahnawake, some Algonquin who had converted to Christianity settled at the mission for part of the year and were known as the Oka Algonquin (Joan Holmes & Associates Inc. 1993).

As a result of increased tensions between the Haudenosaunee and the French, and declining population from disease and warfare, the Cayuga villages were abandoned in 1680 (Edwards 1984:17). Around this time, Anishinaabeg began to mount an organized counter-offensive against the Haudenosaunee who were pushed back to their traditional lands further south, leading to the return of the Michi Saagig Nishnabeg, or Mississauga, to southern and south-eastern Ontario from their winter hunting grounds in the north. This change saw Anishinaabeg gain wider access to European trade goods and allowed them to use their strategic position to act as intermediaries in trade between the British and Indigenous communities to the north (Edwards 1984:10,17; Ripmeester 1995; Surtees 1982; Curve Lake First Nation n.d.).

Following almost a century of warfare, the Great Peace was signed in Montreal in 1701 between New France and 39 Indigenous Nations, including the Anishinaabeg, Huron-Wendat and Haudenosaunee. This led to a period of relative peace and stability. During the first half of the eighteenth century, the Haudenosaunee occupation appears to have been largely restricted to south of the St. Lawrence River, while Mississauga and Ojibwa were living in southern and central Ontario, generally beyond the Ottawa River

[11] These settlements included: Quinaouatoua near present day Hamilton, Teiaiagon on the Humber River, Ganatswekwyagon on the Rouge River, Ganaraske on the Ganaraska River, Kentsio on Rice Lake, Kente on the Bay of Quinte, and Ganneious, near Napanee (Adams 1986).

watershed (Joan Holmes & Associates Inc. 1993:3). Algonquin were residing along the Ottawa River and its tributaries, as well as outside the Ottawa River watershed at Trois-Rivières; Nipissing were located around Lake Nipissing and at Lake Nipigon. Reports from c. 1752 suggest that some non-resident Algonquin and Nipissing were trading at the mission at Lake of Two Mountains during the summer but returning to their hunting grounds "*far up the Ottawa River*" for the winter, and there is some indication that they may have permitted Haudenosaunee residents of the mission to hunt in their territory (Joan Holmes & Associates Inc. 1993:3; Heidenreich and Noël 1987:Plate 40).

In 1754, hostilities over trade and the territorial ambitions of the French and British led to the Seven Years' War, in which many Anishinaabeg fought on behalf of the French. With the French surrender in 1760, Britain gained control over New France, though in recognition of Indigenous title to the land the British government issued the Royal Proclamation of 1763. This created a boundary line between the British colonies on the Atlantic coast and the 'Indian Reserve' west of the Appalachian Mountains. This line then extended from where the 45th parallel of latitude crossed the St. Lawrence River near present day Cornwall northwestward to the southeast shore of Lake Nipissing and then northeastward to Lac St. Jean. The proclamation specified that "*Indians should not be molested on their hunting grounds*" (Joan Holmes & Associates Inc. 1993:4) and outlawed the private purchase of Indigenous land, instead requiring all future land purchases to be made by Crown officials "*at some public Meeting or Assembly of the said Indians*" occupying the land in question (cited in Surtees 1982: 9). In 1764, the post at Carillon on the Ottawa River was identified as the point beyond which traders could only pass with a specific licence to trade in "*Indian Territory*." Petitions in 1772 and again in 1791 described Algonquin and Nipissing territory as the lands on both sides of the Ottawa River from Long Sault to Lake Nipissing. Settlers continued to trespass into this territory, however, cutting trees and driving away game vital to Indigenous lifeways (Joan Holmes & Associates Inc. 1993:5). Akwesasne, within the Haudenosaunee hunting territory, became a permanent settlement towards the middle of the eighteenth century.[12]

At first, the end of the French Regime brought little change to eastern Ontario. Between 1763 and 1776 some British traders traveled to the Kingston area, but the British presence remained sporadic until 1783 when Fort Frontenac was officially re-occupied. With the conclusion of the American Revolutionary War (1775 to 1783), however, the British sought additional lands on which to settle United Empire Loyalists fleeing the United States, disbanded soldiers, and the Mohawk who had fought with the British under Thayendanegea (Joseph Brant) and Chief Deserontyon and were, therefore, displaced from their lands in New York State. To this end, the British government undertook hasty negotiations with Indigenous groups to acquire rights to lands; however, these negotiations did not include Algonquin and Nipissing who were continuously ignored, despite much of the area being their traditional territory (Lanark County Neighbours for Truth and Reconciliation 2019). Initially the focus for settlement was the north shore of

[12] www.firstbatuibs.info/akwesasne.html

Lake Ontario and the St. Lawrence River, resulting in a series of 'purchases' and treaties beginning with the Crawford Purchases of 1783. As noted, these treaties did not include all of the Indigenous groups who lived and hunted in the region and the recording of the purchases – including the boundaries – and their execution were problematic; they also did not extinguish Indigenous rights and title to the land (Joan Holmes & Associates Inc. 1993:5; Royal Commission on Aboriginal Peoples 1996). The *Crown Grant to the Mohawks of the Bay of Quinte* was issued in 1784 in recognition of the Six Nations' support during the American Revolutionary War. It included lands on the Bay of Quinte, originally part of the Crawford Purchases, on which Chief Deserontyon and other Haudenosaunee settled.[13]

Major Samuel Holland, Surveyor General for Canada, began laying out the land within the Crawford Purchases in 1784 with such haste that the newly established townships were assigned numbers instead of names. Euro-Canadian settlement along the north shore of the St. Lawrence River and the eastern end of Lake Ontario began in earnest about this time. By the late 1780s the waterfront townships were full and more land was required to meet both an increase in the size of grants to all Loyalists and grant obligations to the children of Loyalists who were now entitled to 200 acres in their own right upon reaching the age of 21 (H. Belden & Co. 1880:16). In 1792 John Graves Simcoe, Lieutenant Governor of the Province of Upper Canada, offered free land grants to anyone who would swear loyalty to the King, a policy aimed at attracting more American settlers. As government policy also dictated the setting aside of one seventh of all land for the Protestant Clergy and another seventh as Crown reserves, pressure mounted to open up more of the interior. As a result, between 1790 and 1800 most of the remainder of the Crawford Purchases was divided into townships (H. Belden & Co. 1880:16).

A number of other purchases during the late eighteenth century between representatives of the Crown and certain Anishinaabe covered lands immediately west of the Crawford Purchases, from the north shore of Lake Ontario northward to Lake Simcoe and Georgian Bay/Lake Huron. These included the John Collins Purchase of 1785, the Johnson-Butler Purchase[14] of 1787-88, and the 1798 Penetanguishene Purchase (Treaty 5) aimed at acquiring a harbour on Lake Huron for British vessels.[15] The lands purportedly covered by these purchases were often poorly defined and were thus included in the later Williams Treaties of 1923 (see below).

The *Constitution Act* of 1791 created Upper and Lower Canada (later Ontario and Quebec) and established the Ottawa River as the boundary between the two provinces. This effectively divided the Algonquin and Nipissing territories, both of which straddled the

[13] https://www.ontario.ca/page/map-ontario-treaties-and-reserves
[14] Sometimes referred to as the 'Gunshot Treaty' as it reportedly covered the land as far back from the lake shore as a person could hear a gunshot (https://www.ontario.ca/page/map-ontario-treaties-and-reserves).
[15] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

river. The Algonquin and Nipissing sent a letter to the Governor General of the Province of Canada in 1798, requesting that settlers be restricted to the banks of the Ottawa River and detailing the difficulties caused by encroaching settlement (Joan Holmes & Associates Inc. 1993:5; see also Lanark County Neighbours for Truth and Reconciliation 2019). In this letter the Chiefs noted the belt of wampum and map of their lands that was given to Governor Carleton some years earlier, pleading for no more of the encroachment that was driving away game and pushing them into infertile lands; however, there was no response. In the early 1800s, a few Algonquin and Nipissing settled on the shores of Golden Lake, known to them as 'Peguakonagang;' they called themselves 'Ininwezi,' which they translated as 'we people here alone' (Johnson 1928; MacKay 2016).[16] The Golden Lake band, as they initially came to be known, resided in this area for at least part of the year, with various band members maintaining traplines, hunting territories, and sugar bushes.

The War of 1812 between the United States and Great Britain (along with its colonies in North America and its Indigenous allies) brought another period of conflict to the region. In 1815, at the conclusion of the war, the British government issued a proclamation in Edinburgh to further encourage settlement in British North America. The offer included free passage and 100 acres of land for each head of family, with each male child to receive his own 100-acre parcel upon reaching the age of 21 (H. Belden & Co. 1880:16). At the same time, the government was seeking additional land on which to resettle disbanded soldiers from the War of 1812. Demobilized forces could thereby act as a 'force-in-being' to oppose any possible future incursions from the United States. Veterans were encouraged to take up residence within a series of newly created 'military settlements' including those at Perth (1816) and Richmond (1818). The pressure to find more land was exacerbated by the sheer number of settlers moving into the region as a result of these initiatives, which began to push settlement beyond the acquired territory into what had formally been protected as 'Indian Land.'[17]

Additional 'purchases' were signed in the early nineteenth century between the Crown and certain Anishinaabe communities including the Lake Simcoe Purchase (Treaty 16) signed in 1815 and covering lands between Lake Simcoe and Georgian Bay, the Nottawasaga Purchase (Treaty 18) of 1818 to the south and west of the Lake Simcoe Purchase, and the Rice Lake Purchase or Treaty 20 of 1818 which covered a large area around Rice Lake.[18]

Further east, with the settlement of the region underway, Lieutenant Governor Gore ordered Captain Ferguson, the Resident Agent of Indian Affairs at Kingston, to arrange

[16] The Algonquin of River Desert identified The Golden Lake Band using the name "Nozebi'wininiwag," translated as "Pike-Water People" (Speck in Johnson 1928:174).
[17] Between 1815 and 1850 over an estimated 800,000 Euro-Canadian settlers moved into the region (https://www. lanarkcountyneighbours.ca/the-petitions-of-chief-shawinipinessi.html).
[18] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

the purchase of additional lands from the chiefs of the Ojibwa and Mississauga or Michi Saagiig Nishnaabeg. The resulting Rideau Purchase (Treaty 27 and 27¼) extended from the rear of the earlier Crawford Purchases to the Ottawa River and was signed by the Michi Saagiig Nishnaabeg in 1819 and confirmed in 1822. This 'purchase', like the earlier Crawford Purchases, was also problematic and excluded the Algonquin whose traditional territory it covered (Canada 1891:62; Surtees 1994:115). As this purchase included lands within the Ottawa River watershed, the Algonquin and Nipissing protested in 1836 when they became aware of its terms (Joan Holmes & Associates Inc. 1993:6).

As Euro-Canadian settlement spread, Indigenous groups were increasingly pushed out of southern and eastern Ontario, generally moving further to the north and west, although some families remained in their traditional lands, at least seasonally. Records relating to the Hudson's Bay Company, the diaries of provincial land surveyors, the reports of geologists sent in by the Geological Survey of Canada, census returns,[19] store account books and settler's diaries all provide indications of the continued Indigenous settlement in the region, as does Indigenous oral history. In addition to their interactions with the Algonquin who remained in the area, the nineteenth century settlers found evidence of the former extent of Indigenous occupation, particularly as they began to clear the land. In 1819, Andrew Bell wrote from Perth:

> *All the country hereabouts has evidently been once inhabited by the Indians, and for a vast number of years too. The remains of fires, with the bones and horns of deers (sic) round them, have often been found under the black mound... A large pot made of burnt clay and highly ornamented was lately found near the banks of the Mississippi, under a large maple tree, probably two or three hundred years old. Stone axes have been found in different parts of the settlement.*
>
> (cited in Brown 1984:8)

While some Algonquin and Nipissing continued to spend part of the summer at Lake of Two Mountains through this period, most of the year appears to have been spent on their traditional hunting grounds, and by the 1830s there were specific claims for land by individuals such as Mackwa on the Bonnechere River and Constant Pennecy on the Rideau waterway. In 1842, Chief Pierre Shawinipinessi,[20] an Algonquin leader, petitioned the Crown for a land tract of 2,000 acres between the townships of Oso, Bedford and South Sherbrooke to enable his people to sustain themselves (Huitema 2001;

[19] While Indigenous peoples were clearly still residing in the area and making use of the land, they often do not appear in the 1851 to 1871 census records. Huitema (2001:129) notes that Algonquin were sometimes listed in these records as 'Frenchmen' or 'halfbreeds' because they had utilized the mission at Lake of Two Mountains as their summer gathering place and, therefore, were thought of as being French.

[20] There are numerous variations in the spelling of Chief Shawinipinessi's name; he is also known by the name of Peter Stephens or Stevens).

Ripmeester 1995:164-166; Sherman 2008:32-33).[21] A licence of occupation for the 'Bedford Algonquin' was granted in 1844, with Michi Saagiig Nishnaabeg from Alnwick reportedly also living at Bedford (Joan Holmes & Associates Inc. 1993:7-8). Illegal logging operations, however, interfered with life on the reserve, and despite protests from Chief Shawinipinessi and legislation passed in 1838 and then later in 1850 to protect Indigenous lands,[22] it was allowed to continue, depleting the local food resources. In response to an 1861 petition to address the trespassing of settlers, the existence of the Bedford tract was denied (LAC microfilm reel C-13419). At this time some of the community moved to nearby lands while others joined the Algonquin at Kitigan Zibi, and at Pikwàkanagàn where the 'Golden Lake Reserve' was created in 1873 (Hanewich 2009; Joan Holmes & Associates Inc. 1993:9). Around 1836 some consideration was given to facilitating Algonquin and Nipissing settlement in the Grand Calumet Portage and Allumette Island area, but this was not pursued (Joan Holmes & Associates Inc. 1993).

Other treaties signed in the mid-nineteenth century included the St. Regis Purchase (Treaty 57) signed in 1847 between the Crown and the Mohawk and covering a narrow parcel of land, known as the 'Nutfield Tract' extending north of the St. Lawrence River at Cornwall towards the Ottawa River, and the Robinson-Huron Treaty (Treaty 61) of 1850 between the Crown and certain Anishinaabeg for lands east of Georgian Bay and the northern shore of Lake Huron eastward to the Ottawa River.[23]

Through the early twentieth century, off-reserve Algonquin and Nipissing were told to move to established reserves at Golden Lake (Pikwàkanagàn), Maniwaki (Desert River) and at Gibson on Georgian Bay (which had been established for the re-settlement of both Algonquin and Mohawk from Lake of Two Mountains), but many remained in their traditional hunting territories. There is also evidence to suggest that Akwesasne Mohawk trapped and hunted north of their reserve as far as Smiths Falls and Rideau Ferry between c. 1924 and 1948 (Joan Holmes & Associates Inc. 1993:10-11; Sherman 2008:33).

The Williams Treaties of 1923 were signed between the Crown and seven Anishinaabe First Nations to address lands that had not been surrendered via a formal treaty process (see above).[24] These lands covered a large area from the north shore of Lake Ontario to Lake Nipissing and overlapped with a number of other treaties and 'purchases.' The Williams Treaties First Nations include the Chippewas of Beausoleil, Georgina Island and

[21] July 17, 1842 petition 115 addressed to Sir Charles Bagot, Governor General, Library and Archives Canada RG10, V186 part 2, as transcribed in Joan Holmes & Associates Inc. (1993) *Report on the Algonquins of Golden Lake Claim* Vol. 10-12:101.

[22] Chapter XV. An Act for the protection of the Lands of the Crown in this Province, from Trespass and Injury. Thirteenth Parliament, 2nd Victoria, A.D. 1839. An Act for the Protection of the Indians in Upper Canada from Imposition and the Property Occupied or Enjoyed by Them from Trespass and Injury; passed by the government of Upper Canada on August 10, 1850. Available from https://bnald.lib.unb.ca/node/5342; United Canadas (1841-1857) 13 & 14 Victoria – Chapter 74:1409.

[23] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

[24] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

Rama, and the Mississaugas of Alderville, Curve Lake, Hiawatha and Scugog Island. To address further issues with a number of the pre-confederation purchases and treaties, the Williams Treaties First Nations ratified the Williams Treaties Settlement Agreement with Canada and Ontario in June, 2018. This agreement recognized harvesting rights in Treaties 5, 16, 18, 20, 27 and 27¼.[25]

As noted above, lands within traditional Algonquin territory were included in various nineteenth century purchases without Algonquin consultation or consent. Algonquin claims to these lands include a series of petitions to the Crown going back to 1772 that asserted Algonquin rights to land and resources. An official land claim was made in the 1980s and, in 2016, an Agreement-in-Principle was signed by Ontario, Canada and the Algonquins of Ontario, a step towards a treaty recognizing Algonquin rights across much of eastern Ontario.[26]

Cambridge Township and Casselman

The township of Cambridge and village of Casselman are located in the County of Russell. The township has been historically described as generally level, with considerable areas of low-lying land, which was generally swampy, and for the most part covered in dense softwood forests (Belden 1881). The County of Russell was not one of the original nineteen created by Lieutenant Governor of Upper Canada John Graves Simcoe in 1792, but was set apart in 1798. The County was named after Peter Russell, who had served as a military secretary to Sir Henry Clinton during the Revolutionary War and was later made Inspector General of Upper Canada by Simcoe. In 1822 Russell County was united with Prescott for Parliamentary representation. The Township of Cambridge was named after a Christian name of one of the English royal family (Weaver 1913). The settlement of Cambridge was gradual for numerous reasons, primarily because of large tracts of land being held by non-residents. Half of the township was held by four ex-officers who had served during the War of 1812, namely Colonel Rankin, Colonel Brewerton, and two Majors Jessup who were granted 5,000 acres each (Belden 1881).

While much of the land had been granted to British military officers and the township named after an anglophone, the majority of the inhabitants were historically French Canadian (Belden 1881). At the start of the eighteenth century French Canadians were largely settled around seigneuries along the rivers of Lower Canada, but by 1831 many had emigrated further inland and into Upper Canada. Over ten years more than 4,000 French Canadian immigrants settled in the counties of Soulanges, Vaudreuil, Glengarry, Prescott, Russell, and Carleton (Le Droit 1934). Cambridge Township, however,

[25] www.williamstreatiesfirstnations.ca

[26] https://www.ontario.ca/page/map-ontario-treaties-and-reserves

remained relatively uninhabited, and could only boast one freeholder and one squatter in 1837 (Belden 1881).

The majority of the early history of Cambridge centred on Martin Casselman, a pioneer, lumberman, agriculturist, municipal legislator, and founder of the village of Casselman. He originally explored the area in 1830 in search of a good location for a mill (Belden 1881). He was unable, however, to establish his business until 1843 when he purchased 1,000 acres from absentee land owner Major Edward Jessup (Adams 2005). Casselman erected his mill the following year along the South Nation River about 40 miles by river from where it drained into the Ottawa River, the main route for the lumber trade at the time. While this mill attracted pioneer lumbermen to the area, the population of the township did not become particularly dense (Belden 1881). By 1842 there were only 108 inhabitants, too few and too poor to build the roads which would have facilitated faster growth (Smith 1851).

The major transportation artery through the area besides the South Nation River was the Grand Trunk Railway which ran from Montreal to Brockville and was completed in 1855 (Harkness 1946). One of Martin Casselman's last acts was to facilitate and fund the establishment of the railway to the village in 1880-1881 (Adams 2005). The Casselman family was also politically influential, representing Cambridge continuously in the district and county councils (Belden 1881). In 1891 the Casselman mill burned down and as not rebuilt. The village itself suffered further devastating fires in 1897 and 1919. While these fires caused some displacement to the lumber workers, they did lead to previously uncultivated lands becoming fertile enough for agriculture which brought a new wave of settlement into the area (Adams 2005).

3.3 Property History

Lot 9, Concession 8

The 200 acres which comprises Lot 9, Concession 8 was granted to John Rankin by the Crown in 1828 (Russell County Land Registry Office or RCLRO). An 1834 patent plan does appear to depict what may be a dwelling within the boundaries of the study area; however given the age of the map it is difficult to be certain (Map 3). William Rankin sold all 200 acres to George B. Lyon in 1854, and later that year it was acquired by Lemuel Cushing (RCLRO instruments 6405 and 6813). It remained in the Cushing family until 1881 (see below), though there is some confusion in the land abstract index as George B. Lyon Fellows et al. are recorded as selling the 200 acres to Martin Casselman, the founder of the village of Casselman, in 1858 (RCLRO instrument 7008). Martin Casselman, however, lived on the same lot where he had erected the mill - Lot 11, Concession 6. Levi Casselman, aged 35, is listed in the 1861 agricultural census as living on Lot 9, Concession 8, where he had a 200 acre farm and a one-storey log house which he shared with his wife, sister, and four children. The farm had 80 acres under cultivation, with 44 ½ acres in crop and 35 acres as pasture; the remaining 120 acres were still wooded or

wild (LAC microfilm reel C-1071). Casselman is not, however, depicted as the landowner on the 1862 Walling map, where Lot 9 is blank (see Map 3). The 1871 census again lists Levi as the owner of the lot, this time with a 300 acre farm and five barns (LAC microfilm reel C-10012). Conversely, Levi Casselman does not appear in any of the rural directories and is not listed in relation to this lot on any census taken after 1871.

Following the death of Lemuel Cushing in 1876, his will listed Catherine, James B., Thomas, and Lemuel jr. as benefactors, though Catherine appears to have taken control of the property (RCLRO instruments 40 and 41). She later, in 1881, sold the 200 acres to Odile Matte (RCLRO instrument 1229). Unfortunately the 1881 Belden map of Cambridge Township was a version that only included the residences of paid subscribers, and unsurprisingly no dwelling or landowner is illustrated on Lot 9 (see Map 3). Matte was listed in both the 1884 and 1885 rural directories as occupying land on Lot 9, though in 1881 he had sold the northern 100 acres to Cyprien Charron (Fuller 1884; The Union Publishing Company 1885; RCLRO instrument 1362). The 1901 census describes Odile Matte as having been born in 1845 in Quebec, but by that date living with his wife Octavia, his sister, and his four children in a house on the remaining 100 acres. The last time he appeared in the directories was in 1904 (The Union Publishing Company 1904).

Charron was listed on Lot 9 in the 1884 and 1885 rural directories but not in any census returns (Fuller 1884; The Union Publishing Company 1885). In 1894 he sold the northeastern quarter or 50 acres to Henri Charron, likely his son (RCLRO instrument 4443). The 1901 census confirms that Henri owned a 50 acre parcel containing a house which he shared with his wife and son. He is described as a 30-year-old French Canadian born in Ontario, and later appeared in the 1916 rural directory (Henry Vernon and Son 1916). Cyprien Charron sold his remaining 50 acres to Joseph Laplante in 1898 (RCLRO instrument 4547). The 1901 census describes Laplante as a 31-year-old French Canadian farmer living with his wife and three children (LAC microfilm reel T-6494). Both Joseph Laplante and Anthime Matte (who must have inherited his father's 100 acres) are listed as farmers on Lot 9, Concession 8 in the 1904 rural directory; Anthime Matte is also listed in the 1916 edition (The Union Publishing Company 1904; Henry Vernon & Son 1916). In 1924 Henri Charron sold his land to Joseph Saffich (RCLRO instrument 4277).

Joseph Laplante and Anthime Matte came to own their land, however they are both listed as farmers on Lot 9, Concession 8 on the 1904 Farmers Directory. Anthime Matte is also listed on the 1916 Farmers Directory. Route 800 appears to have been built by 1881 as it is depicted on the Belden map; Butternut creek is also shown though a bridge is not explicitly illustrated (see Map 3). A 1908 one-inch-to-one-mile topographic map of the area depicts several buildings on Lot 9, though none within the study area (Map 4). A small woodlot is shown south of Route 800 surrounding Butternut Creek, with the remainder of the study area consisting of an open field. County Road 7 veered much further to the west until crossing the creek than it does at present, curving around an existing farm. Little had changed by 1939, apart from a residence having been constructed just to the east of the study area along Paul Latour Road/Route 800.

A pair of aerial photographs continues to show little change through the second half of the twentieth century, though County Road 7 was in the process of being realigned to the east of the existing farm in 1964 (see Map 4). Nothing appears to have been built within the study area, though a small woodlot at the intersection of Route 800 and County Road 7 visible in 1964 had been removed by 1994.

4.0 ARCHAEOLOGICAL CONTEXT

This section describes the archaeological context of the study area, including known archaeological research, known cultural heritage resources (including archaeological sites), and environmental conditions. In combination with the historical context outlined above, this provides the necessary background information to evaluate the archaeological potential of the property.

4.1 Previous Archaeological Research

In order to determine whether any previous archaeological fieldwork has been conducted within or in the immediate vicinity of the present study area, a search of the titles of reports in the *Public Register of Archaeological Reports* maintained by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) was undertaken. To augment these results, a search of the Past Recovery corporate library was also conducted.[27]

No known archaeological assessments have been undertaken in the immediate vicinity of the study area, though several assessments have been completed within the Village of Casselman.

4.2 Previously Recorded Archaeological Sites

The primary source for information regarding known archaeological sites in Ontario is the *Archaeological Sites Database* maintained by the Ontario by the Ministry of Tourism, Culture, and Sport (MHSTCI). The database largely consists of archaeological sites discovered by professional archaeologists conducting archaeological assessments required by legislated processes under land use development planning (largely since the late 1980s). A search of the *Sites Database* indicated that there are no known archaeological sites within 1 km of the study area. It is worth noting, however, that a number of Archaic period registered sites have been found along the shores of the South Nation River, to which Butternut Creek is connected. One of these site, Wimbàbikàn or BhFs-6, is located on the east bank of the river within the Town of Casselman, approximately 3.8 km north-northwest of the study area (Intermesh Enterprises 2011a and 2011b).

[27] In compiling the results, it should be noted that archaeological fieldwork conducted for research purposes should be distinguished from systematic property surveys conducted during archaeological assessments associated with land use development planning (generally after the introduction of the *Ontario Heritage Act* in 1974 and the *Environmental Assessment Act* in 1975), in that only those studies undertaken to current standards can be considered to have adequately assessed properties for the presence of archaeological sites with cultural heritage value or interest. In addition, it should be noted that the vast majority of the research work undertaken in the area has been focussed on the identification of pre-Contact Indigenous sites, while current MHSTCI requirements minimally require the evaluation of the material remains of occupations and or land uses pre-dating 1900.

4.3 Cultural Heritage Resources

The recognition or designation of cultural heritage resources (here referring only to built heritage features and cultural heritage landscapes) may provide valuable insight into aspects of local heritage, whether identified at the local, provincial, national, or international level. As some of these cultural heritage resources may be associated with significant archaeological features or deposits, the background research conducted for this assessment included the compilation of a list of cultural heritage resources that have previously been identified within or immediately adjacent to the current study area. The following sources were consulted:

- Federal Heritage Buildings Review Office online Directory of Heritage Designations (http://www.pc.gc.ca/eng/progs/beefp-fhbro/index.aspx);
- Canada's Historic Places website (http://www.historicplaces.ca/en/home accueil.aspx);
- Ontario Heritage Properties Database (http://www.hpd.mcl.gov.on.ca/scripts/ hpdsearch/english/default.asp);
- Ministry of Tourism, Culture and Sport's List of Heritage Conservation Districts (http://www.mtc.gov.on.ca/en/heritage/heritage_conserving_list.shtml); and,
- Ontario Heritage Trust website (heritagetrust.on.ca).

A search of the on-line databases identified no designated built heritage properties within or adjacent to the study area. Of interest, the original Grand Trunk Railway right-of-way passed through the area approximately 1.7 km to the east of the study area.

4.4 Heritage Plaques and Monuments

The recognition of a place, person, or event through the erection of a plaque or monument may also provide valuable insight into aspects of local history, given that these markers typically indicate some level of heritage recognition. As with cultural heritage resources (built heritage features and/or cultural heritage landscapes), some of these places, persons, or events may be associated with significant archaeological features or deposits. Accordingly, this study included the compilation of a list of heritage plaques and/or markers in the vicinity of the study area. The following sources were consulted:

- The Ontario Heritage Trust inventory of provincial plaques across Ontario (2021-Provincial-plaques-Open-data-v02-FINAL-ENG.pdf (heritagetrust.on.ca);
- A listing of plaques transcribed at www.readtheplaque.com;
- Parks Canada Directory of Federal Heritage Designations (https://www.pc.gc.ca/apps/dfhd/default_eng.aspx); and,
- A listing of historical plaques of Ontario maintained by Sarah J. McCabe (https://ontarioplaques.omeka.net/).

No plaques or monuments were located within or in the immediate vicinity of the current study area.

4.5 Cemeteries

The presence of historical cemeteries in proximity to a parcel undergoing archaeological assessment can pose archaeological concerns in two respects. First, cemeteries may be associated with related structures or activities that may have become part of the archaeological record, and thus may be considered features indicating archaeological potential. Second, the boundaries of historical cemeteries may have been altered over time, as all or portions may have fallen out of use and been forgotten, leaving potential for the presence of unmarked graves. For these reasons, the background research conducted for this assessment included a search of available sources of information regarding historical cemeteries. For this study, the following sources were consulted:

- A complete listing of all registered cemeteries in the province of Ontario maintained by the Consumer Protection Branch of the Ministry of Consumer Services (last updated 06/07/2011);
- Field of Stones website; Field of Stones (rootsweb.com);
- Ontario Cemetery Locator website maintained by the Ontario Genealogical Society (https://vitacollections.ca/ogscollections/2818487/data?g=d);
- Ontario Headstones Photo Project website (https://canadianheadstones.ca/wp/cemetery-lookup/); and,
- Available historical mapping and aerial photography.

No known cemeteries were located within or adjacent to the study area. The closest cemetery was the St. Albert Cemetery, situated 5.6 kilometres southwest of the study area on Lot 19, Concession 10. It should be noted, however, that there is always the possibility of there being unrecorded burial plots on rural properties.

4.6 Mineral Resources

The presence of scarce mineral resources on or near to a property may indicate potential for archaeological resources associated with both pre-Contact and post-Contact exploration and exploitation. For this reason, the background research conducted for the assessment includes a search of available sources of information on the locations of outcrops of rare and highly valued minerals, such as quartz, chert, ochre, copper, and soapstone, as well as minerals sought out by post-Contact prospectors and miners for more industrial-scale exploitation (i.e. gold, copper, iron, mica, etc.). Useful tools in this search are provided by databases maintained by the Ontario Geological Survey and the Ministry of Northern Development and Mines, including:

- *Abandoned Mines Information System* which contains a list of all known abandoned and inactive mine sites and associated features in the province;

- *Mining Claims* which contains a list of all active claims, alienations, and dispositions;
- *Mineral Deposits Inventory* which contains a list of known mineral occurrences of economic value in the province;
- *Bedrock Geology Data Set*, which shows the distribution of bedrock units and illustrates geologic rock types, major faults, iron formations, kimberlite intrusions, and dike swarms.

A review of the above-mentioned databases uncovered no evidence of mineral resources located within the study area.

4.7 Local Environment

The assessment of present and past environmental conditions in the region containing the study area is a necessary component in determining the potential for past occupation as well as providing a context for the analysis of archaeological resources discovered during an assessment. Factors such as local water sources, soil types, vegetation associations and topography all contribute to the suitability of the land for human exploitation and/or settlement. For the purposes of this assessment, information from local physiographic, geological and soils research has been compiled to create a picture of the environmental context for both past and present land uses.

The physiography and distribution of surficial material in this area are largely the result of glacial activity that took place in the Late Wisconsinan. This period, which lasted from approximately 23,000 to 10,000 years before present, was marked by the repeated advance and retreat of the massive Laurentide Ice Sheet (Barnett 1992 in Rowell 1997:12). As the ice advanced, debris from the underlying sediments and bedrock accumulated within and beneath the ice. The debris, a mixture of stones, sand, silt, and clay, was deposited over large areas as till plains, drumlins, and moraines. During deglaciation, as the Late Wisconsinan ice margin receded to the north, waters from the Atlantic Ocean flooded the isostatically-depressed upper St. Lawrence and Ottawa valleys and formed the Champlain Sea. Landforms and deposits north of the Ottawa River suggest that the maximum elevation reached by the Champlain Sea was between approximately 180-190 metres above the present sea level, which would have covered the region containing the current study area (Rowell 1997:12). Extensive deposits of fine-grained sediments, representative of deep-water environments, were laid down during this time. Continued isostatic rebound lead to the retreat of the glaciomarine waters, leaving behind boulder gravel spits, bars, and beaches at elevations between 120 and 60 metres (Rowell 1997:12). During the regression of the Champlain Sea, the ancestral Ottawa River and its north bank tributaries created extensive deposits of deltaic sands and formed numerous sand bars. Owing to poor drainage characteristics associated with the underlying clays, extensive bogs subsequently developed, in low-lying areas, accumulating peat and other organic deposits.

The study area is situated within the Winchester Clay Plain physiographic region which is typified by deposits associated with the Champlain Sea and is relatively flat, though a number of drumlin-shaped hills have been identified across its surface (Chapman and Putnam 1984). In a few cases there are areas of shallow soil over bedrock and occasional bars, beaches, and boulder pavements. Surficial geological mapping, completed at a 1:50,000 scale, indicates that much of the study area is composed entirely of glaciomarine offshore deposits of clay, silt and sand (Map 5; Rowell 2010).

Provincial topographic mapping shows the study area to sit at an elevation between 62 and 65 metres amsl (see Maps 1 and 5). Soil survey mapping, completed at a 1:50,000 scale, indicates that the study area is comprised of two soil types: North Gower clay loam and an eroded channel (see Map 5). The North Gower soil series developed on clay deposits of either lacustrine or marine origin, with varves or thin sedimentary layers present in the parent material. These soils are generally found in areas with a smooth topography that is characteristic of large clay flats. Water moves slowly through clay textured materials, and therefore the soil is wet for a large part of the year. Eroded channel soils have been identified along the course of Butternut Creek which runs along the southwestern edge of the study area. This soil type is used to refer to small, gully-like channels and stream valley slopes on which the soil is bare and exposed for most of the year (Wicklund et al. 1961).

The area belongs to the Upper St. Lawrence Division of the Great Lakes-St. Lawrence Forest Region of Canada. This region is characterized by a mixture of coniferous and deciduous tree species, dominated by sugar maple and beech, with red maple, yellow birch, basswood, white ash, largetooth aspen, and road and bur oaks. Local occurrences of white oak, red ash, grey birch, rock elm, blue-beech, and bitternut hickory are also known. Butternut, eastern cottonwood, and slippery elm have a sporadic distribution in river valleys, and some small pure stands of black and silver maple have been reported on fertile, fine-textured lowland soils. Poorly-drained depressions frequently carry a hardwood swamp type in which black ash is prominent (Rowe 1972:94).

The study area is bordered by Butternut Creek which is drained by the Middle South Nation River sub-watershed, which flows northwest along fault lines to where it joins with the South Nation River. The South Nation River flows in a north-easterly direction from the headwaters just before Brockville to Plantagenet before discharging into the Ottawa River.[28]

[28] https://www.nation.on.ca/

5.0 STAGE 1 ARCHAEOLOGICAL ASSESSMENT

This section of the report includes an evaluation of the archaeological potential within the study area, in which the results of the background research described above are synthesized to determine the likelihood of the property to contain significant archaeological resources.

5.1 Optional Property Inspection

An optional site inspection was not undertaken as part of the Stage 1 assessment.

5.2 Evaluation of Archaeological Potential

The evaluation of the potential of a particular parcel of land to contain significant archaeological resources is based on the identification of local features that have demonstrated associations with known archaeological sites. For instance, archaeological sites associated with pre-Contact settlements and land uses are typically found in close physical association with environmental features such as sources of potable water, transportation routes (navigable waterways and trails), accessible shorelines, areas of elevated topography (i.e. knolls, ridges, eskers, escarpments, and drumlins), areas of sandy and well-drained soils, distinctive land formations (i.e. waterfalls, rock outcrops, caverns, mounds, and promontories and their bases), as well as resource-rich areas (e.g. migratory routes, spawning areas, scarce raw materials, etc.). Similarly, post-Contact archaeological sites are often found in association with many of these same environmental features, though they are also commonly connected with known areas of early Euro-Canadian settlement, early historical transportation routes (e.g. roads, trails, railways, etc.), and areas of early Euro-Canadian industry (i.e. the fur trade, logging and mining). For this reason, assessments of the potential of a particular parcel of land to contain post-Contact archaeological sites rely heavily on historical and archival research, including reviews of available land registry records, census returns and assessment rolls, historical maps, and aerial photographs. The locations of previously discovered archaeological sites can also be used to shed light on the chances that a particular location contains an archaeological record of past human activities.

Archaeological assessment standards established in the *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011) specify which factors, at a minimum, must be considered when evaluating archaeological potential. Licensed consultant archaeologists are required to incorporate these factors into potential determinations and account for all features on the property that can indicate the potential for significant archaeological sites. If this evaluation indicates that any part of a subject property exhibits potential for archaeological resources, the completion of a Stage 2 archaeological assessment is commonly required prior to the issuance of approvals for activities that would involve soil disturbances or other alterations.

The *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011) also establish minimum distances from features of archaeological potential that must be identified as exhibiting potential for sites. For instance, this includes all lands within 300 metres of primary and secondary water sources, past water sources (i.e. glacial lake shorelines), registered archaeological sites, areas of early Euro-Canadian settlement, or locations identified as potentially containing significant archaeological resources by local histories or informants. It also includes all lands within 100 metres of early historic transportation routes (e.g. roads, trails, and portage routes). Further, any portion of a property containing elevated topography, pockets of well-drained sandy soils, distinctive land formations, resource-rich/harvesting areas, and/or previously identified cultural heritage resources (i.e. built heritage properties and/or cultural heritage landscapes that may be associated with significant archaeological resources) must also be identified as exhibiting archaeological potential.

5.3 Analysis and Conclusions

The background research undertaken for this assessment indicates that the subject property exhibits potential for the presence of significant archaeological resources associated with pre-Contact settlement and/or land uses. Specifically:

- The study area lies within 100 metres of Butternut Creek, a source of potable water and potential food resources; the banks of the creek might have served as suitable locations for temporary camps of pre-Contact hunter-gatherer populations; and,
- The study area lies within 100 metres of Butternut Creek which is part of the South Nation River drainage system, and may therefore potentially have been a transportation route used by pre-Contact hunter-gatherer populations.

The study area also exhibits characteristics that indicate potential for the presence of archaeological resources associated with post-Contact settlement and/or land uses. Specifically:

- The study area lies within 100 metres of Butternut Creek, a source of potable water and potential food resources; and,
- The study area lies within 100 metres of Route 800 and/or County Road 7, both historical transportation corridors depicted on nineteenth century mapping.

The evaluation of archaeological potential also included a review of available sources of information (i.e. high resolution aerial photographs and satellite imagery) to determine if part or all of the study area had been subject to deep and intensive soil disturbance (i.e. quarrying, road construction, major landscaping involving grading below topsoil, former building footprints, sewage and infrastructure development, etc.) in the recent past, as these activities would have severely damaged the integrity of or removed any archaeological resources that might have been present. The two roadbeds that run through the study area and accompanying ditching to either side can be determined to

have been deeply disturbed. The remaining property examined as part of the Stage 1 study has been found to retain archaeological potential. The archaeological potential associated with the overall study area has been illustrated on Map 6.

5.4 Stage 1 Recommendations

The results of the background research discussed above indicated that the study area exhibits potential for the presence of significant archaeological resources. Accordingly, it is recommended that:

1) The portions of the study area that have been determined to exhibit archaeological potential should be subject to Stage 2 archaeological assessment prior to the initiation of below-grade soil disturbances or other alterations (see Map 6).

2) Any future Stage 2 archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011). There is currently a mixture of an active field and other non-agricultural lands within the study area; all portions identified as exhibiting archaeological potential should therefore be assessed by means of a pedestrian survey or shovel test pit survey conducted at 5 metre intervals, as appropriate.

6.0 STAGE 2 ARCHAEOLOGICAL ASSESSMENT

This section of the report describes the methodology used and results of the Stage 2 property survey conducted to determine whether the subject property contains significant archaeological resources.

6.1 Field Methods

The archaeological fieldwork for the Stage 2 property survey was completed over the course of one day, on April 20th, 2022, by a crew consisting of a licensed field director and three experienced field technicians. All fieldwork was conducted according to criteria outlined in *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011). Weather conditions were generally consistent over the course of the fieldwork, with partly cloudy skies, and a temperature of 2°C. At all times during the assessment lighting, temperature, and soil conditions were conducive to the identification, documentation, and recovery of archaeological resources.

In order to ensure full coverage during the Stage 2 property survey, the Past Recovery field crew used 'Mapit Pro' GIS software on a tablet loaded with detailed satellite imagery overlain with the study area. This digital mapping interface, along with a high accuracy, GIS-mapping-grade Global Navigation Satellite System (GNSS) receiver, allowed the field crew to accurately delimit the study area in relation to their 'real time' position. The GNSS unit employed for this purpose was a Trimble Catalyst DA1 antennae connected to a Samsung tablet running Trimble Mobile Manager software and receiving Trimble RTX corrections. While in use, the receiver reported accuracies within the range of plus or minus 2 m.

The study area consisted of a freshly ploughed agricultural field, part of a woodlot, manicured lawns, roads, a creek, slopes greater than 20 degrees and low-lying and wet areas (Images 1 to 3). Accordingly, the Stage 2 testing was conducted by a combination of a pedestrian survey at 5 m intervals and test pit survey at 5 m intervals (Map 7). Areas excluded from testing included two water-saturated areas around culverts located north of Route 800 and west of County Road 7 respectively (Images 4 and 5), and sloped areas within the right-of-way to the east of County Road 7 and to the west of the agricultural field, and to the north and south of Route 800 (Image 6; see Image 3). Table 1 below indicates the sizes of these areas, as well as the sizes of the areas subjected to each survey method.

Pedestrian survey at 5 m intervals was undertaken within the actively cultivated filed forming the majority of the study area. The field was ploughed and allowed to weather through at least one heavy rainfall prior to the pedestrian survey. Direction was provided to the farmer undertaking the ploughing to plough deep enough to ensure total topsoil exposure, but not deeper than previous ploughing. At the time of the assessment, surface

Table 1. Estimates of Survey Coverage during the Stage 2 Property Survey.

Survey Type	Area (ha)	Percentage of Study Area
Shovel test pit survey at 5 m intervals	0.09	3%
Pedestrian survey at 5 m intervals	2.27	80%
Disturbed to subsoil (not tested)	0.21	7%
Low and wet with permanently saturated soils (not tested)	0.12	4%
Steep slope, greater than 20 degrees (not tested)	0.2	6%

visibility conditions exceeded the minimum requirements established by MHSTCI, where 80% of the ploughed ground surface must be visible (Image 7). The pedestrian survey was conducted by means of the Past Recovery field crew systematically walking the ploughed fields at 5 m intervals and inspecting the exposed surface for the presence of archaeological resources.

The test pit survey was conducted using shovels and trowels, with back-dirt screened through a 6 mm (1/4 inch) hardware mesh and carefully examined for artifacts. All test pits were dug to sterile subsoil and were at least 30 cm in diameter. The sides and bottoms of test pits were visually inspected for evidence of buried topsoil layers or other meaningful cultural deposits, subsurface features, and evidence of deep and intensive disturbance or fill layers. Once excavation and any required recording had been completed, all test pits were backfilled. Descriptions and measurements of the soil stratigraphy in specific test pits were maintained in a digitized field log, with soil layers assigned lot numbers in the order of appearance. Representative test pits were also digitally photographed.

Field activities were recorded through field notes, digital photographs, and field maps. A catalogue of the material generated during the Stage 2 property survey is included below in Table 2. The complete photographic catalogue is included as Appendix 1, and the locations and orientations of all photographs referenced in this section of the report are shown on Map 7. As per *Terms and Conditions for Archaeological Licences* in Ontario, curation of all photographs and field notes generated during the Stage 2 archaeological assessment is being provided by Past Recovery pending the identification of a suitable repository.

Table 2. Inventory of the Stage 2 Documentary Record.

Type of Document	Description	Number of Records	Location
Field notes	Notes on the Stage 2 fieldwork	7 pages	Past Recovery office – file PR21-022
Maps	Field maps	1 page	Past Recovery office – file PR21-022
Photographs	Digital photographs documenting the Stage 2 fieldwork	20 photographs	On Past Recovery computer network – file PR21-022

6.2 Fieldwork Results

The majority of the study area was composed of the active agricultural field, which was ploughed and pedestrian surveyed at 5 m intervals (Image 8; see Image 1). The field plough zone consisted dark brown loam clay, and was relatively clean. No archaeological resources were identified during the pedestrian survey. The terrain south of Route 800 within the right-of-way consisted of a woodlot, a manicured lawn and the shallow bank of Butternut Creek which was subject to shovel test pit survey (Images 9 and 10). The test pits excavated in the woodlot and manicured lawn consisted of 20 cm of dark brown clay loam topsoil above grey clay subsoil (Image 11). Test pits completed in proximity to Butternut Creek where slightly shallower and consisted of 10 cm of dark brown sandy loam topsoil over grey sand subsoil (Image 12). No archaeological resources were identified during the shovel test pit survey.

6.3 Record of Finds

No archaeological resources of cultural heritage value or interest were found during the Stage 2 survey.

6.4 Analysis and Conclusions

The Stage 2 archaeological assessment involved a pedestrian survey at 5 m intervals, and a test-pit survey at 5 m intervals across all portions of the study area determined to exhibit archaeological potential; the remainder was not tested having been determined to be permanently wet, sloped or disturbed (see Map 7). As mentioned above, no archaeological resources were found over the course of this assessment.

6.5 Stage 2 Recommendations

The results of the archaeological assessment documented in this report form the basis for the following recommendations:

1) As the Stage 2 property survey did not result in the identification of any archaeological sites requiring further assessment or mitigation of impacts, no further archaeological assessment of the study area as defined in Map 2 is required.

2) In the event that future planning results in the identification of additional areas of impact beyond the limits of the present Stage 2 study area, further archaeological assessment may be required. It should be noted that screening for impacts should include all aspects of the proposed development that may cause soil disturbances or other alterations, and that that even temporary property needs should be considered. Any additional archaeological assessment should be undertaken by a licensed consultant archaeologist, in compliance with *Standards and Guidelines for Consultant Archaeologists* (MHSTCI 2011).

The reader is also referred to Section 7.0 below to ensure compliance with relevant provincial legislation and regulations as may relate to this project.

7.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In order to ensure compliance with relevant Provincial legislation as it may relate to this project, the reader is advised of the following:

1) This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

2) It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

3) Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

4) The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

5) Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

8.0 LIMITATIONS AND CLOSURE

Past Recovery Archaeological Services Inc. has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the archaeological profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied, is made.

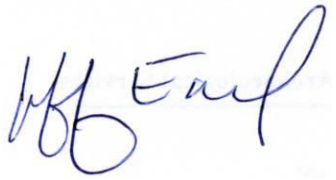
This report has been prepared for the specific site, design objective, developments and purpose prescribed in the client proposal and subsequent agreed upon changes to the contract. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the client in the design of the specific project.

Special risks occur whenever archaeological investigations are applied to identify subsurface conditions and even a comprehensive investigation, sample and testing program may fail to detect all or certain archaeological resources. The sampling strategies in this study comply with those identified in the Ministry of Heritage, Sport, Tourism and Culture Industries' *Standards and Guidelines for Consultant Archaeologists* (2011).

The documentation related to this archaeological assessment will be curated by Past Recovery Archaeological Services Inc. until such a time that arrangements for their ultimate transfer to an approved and suitable repository can be made to the satisfaction of the project owner(s), the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries and any other legitimate interest group.

We trust that this report meets your current needs. If you have any questions or if we may be of further assistance, please do not hesitate to contact the undersigned.



Jeff Earl, M.Soc.Sc.
Principal
Past Recovery Archaeological Services Inc.

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NMC 21920 *Map of the Counties of Stormont, Dundas, Glengarry, Prescott & Russell Canada West: from actual surveys under the direction of H.F. Walling* (1862)

Microfilm Reel:

C-1071	1861 census of Cambridge Township
C-10012	1871 census of Cambridge Township
T-6494	1901 census of Cambridge Township

National Air Photo Library (NAPL):

Year	*Roll#*	*Photo*	*Scale*
1964	A18566	182	35,000
1994	A28051	015	35,000

Ontario Council of University Libraries – Historical Topographic Map Digitization Project (accessed online at: https://ocul.on.ca/topomaps/):

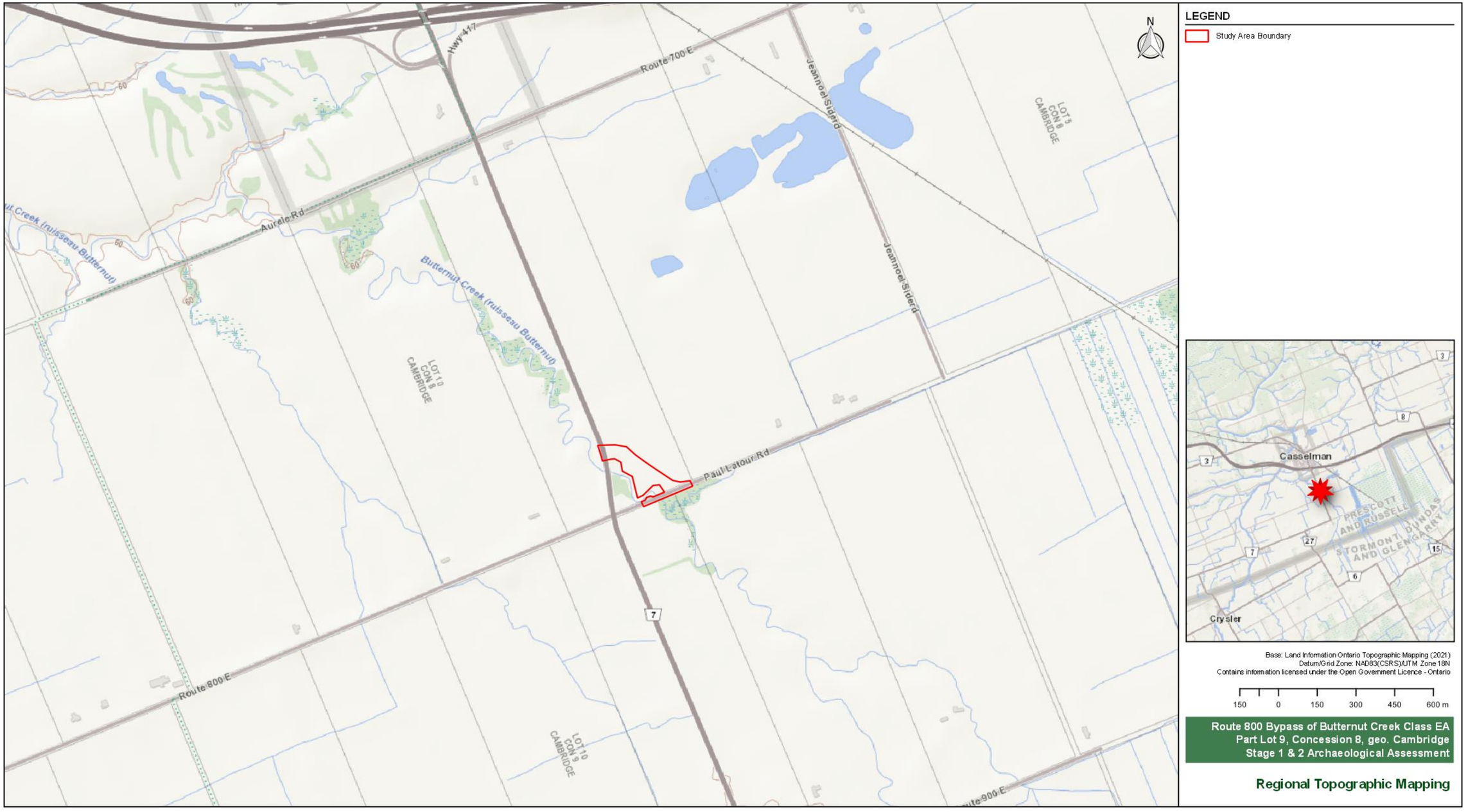
National Topographic System (NTS) Map Sheets

31F01	Russell Sheet	1908	1:63,360
31F01	Russell Sheet	1939	1:63,360

Russell County Land Registry Office (RCLRO)

Land Registry Abstract Index: Lot 9, Concession 8, Township of Cambridge

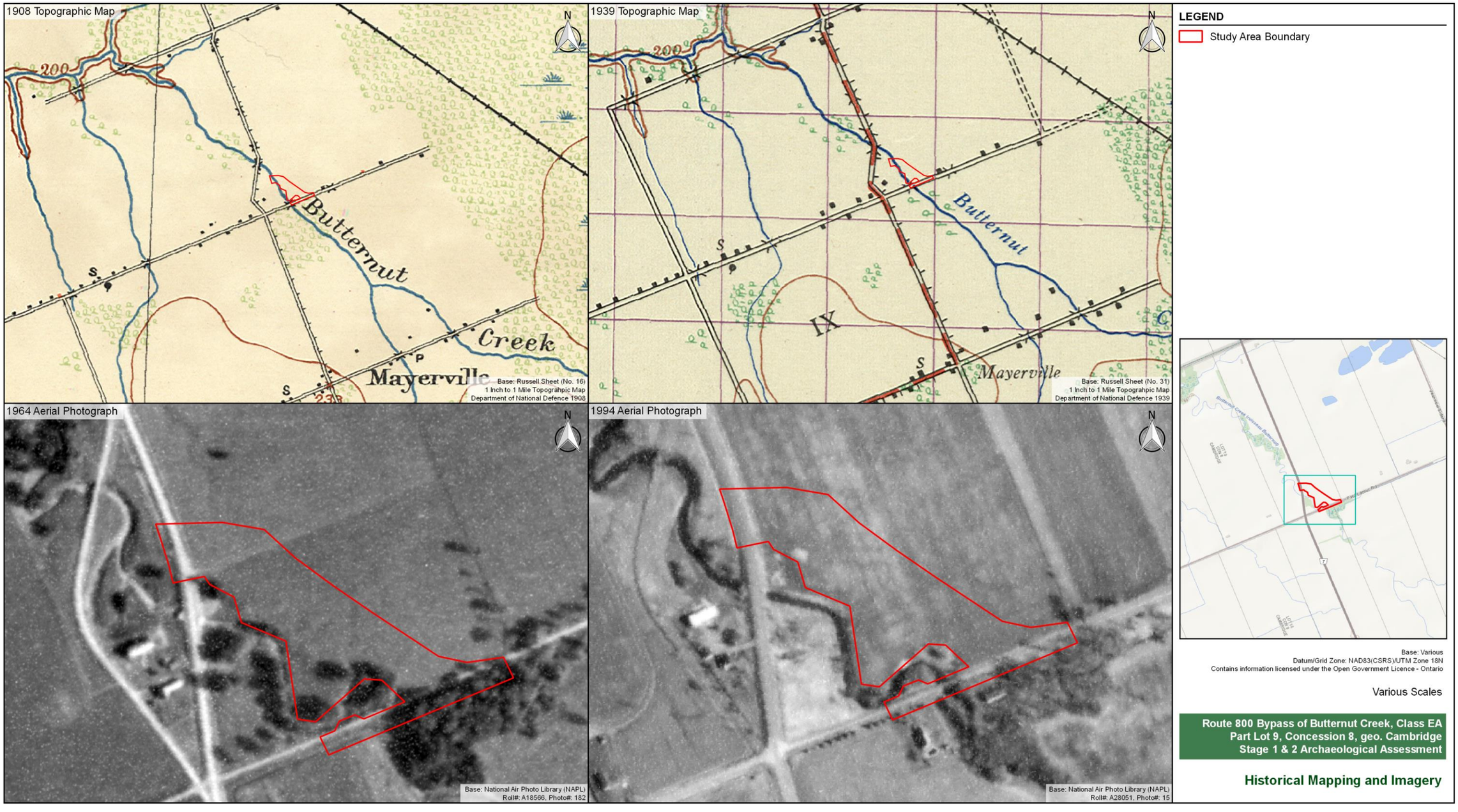
10.0 MAPS



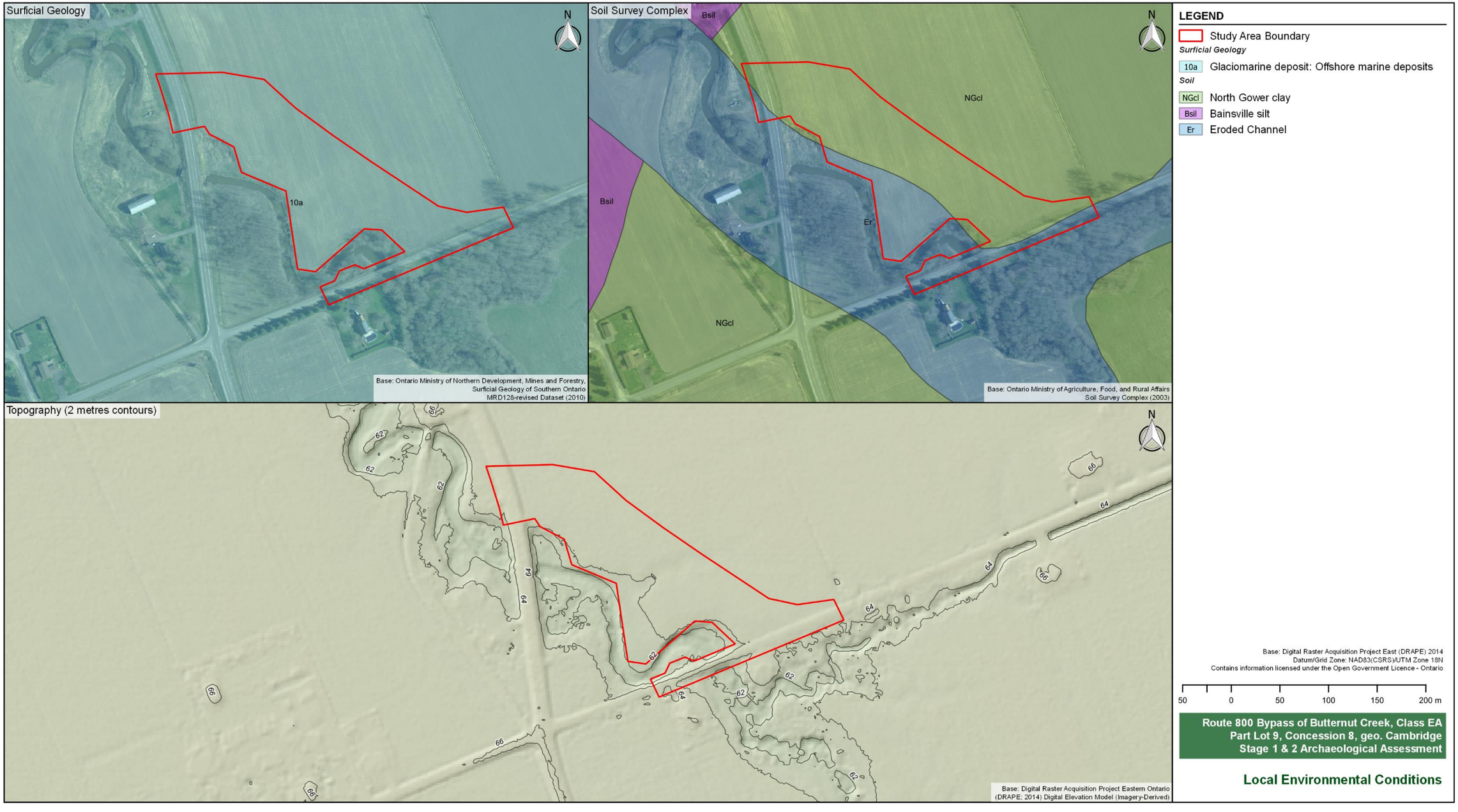
Map 1. Regional topographic mapping showing the location of the study area.

Map 2. Recent (2014) orthographic imagery showing the location and limits of the study area.

Map 3. Segments of historical maps showing the approximate location and limits of the study area.



Map 4. Historical topographic mapping and aerial photography showing the location and limits of the study area.



Map 5. Local environmental conditions, including surficial geology, elevation, and soil survey mapping, showing the location and limits of the study area.

Map 6. Recent (2014) orthographic imagery showing areas of archaeological potential in the study area.

Map 7. Recent (2014) orthographic imagery showing the Stage 2 survey methodology and the approximate locations and orientations of fieldwork photographs referenced in this report.

11.0 IMAGES

Image 1. View of the agricultural field which comprises the majority of the study area and field crew undertaking pedestrian field survey at 5 m intervals, facing southeast. (PR21-022D004)

Image 2. View of Paul Latour Road (Route 800) and the woodlot which comprises the southern edge of the right-of-way within the study area, facing east. (PR21-022D007)

Image 3. View of the bridge which crosses Butternut Creek and associated disturbed slopes south of Paul Latour Road (Route 800), facing west. (PR21-022D014)

Image 4. View of the saturated culvert south of the active agricultural field, facing east. (PR21-022D005)

Image 5. View of the saturated culvert west of County Road 7, facing north. (PR21-022D018)

Image 6. View of the slope north of Paul Latour Road (Route 800) associated with the bridge crossing Butternut Creek (also visible), facing west. (PR21-022D017)

Image 7. View of conditions within the ploughed agricultural field, facing south. (PR21-022D003)

Image 8. View of field crew undertaking pedestrian survey at 5 m intervals at the south end of the agricultural field, facing north. (PR21-022D020)

Image 9. View of field crew undertaking shovel test pit survey at 5 m intervals in the woodlot south of Paul Latour Road (Route 800), facing northwest. (PR21-022D008)

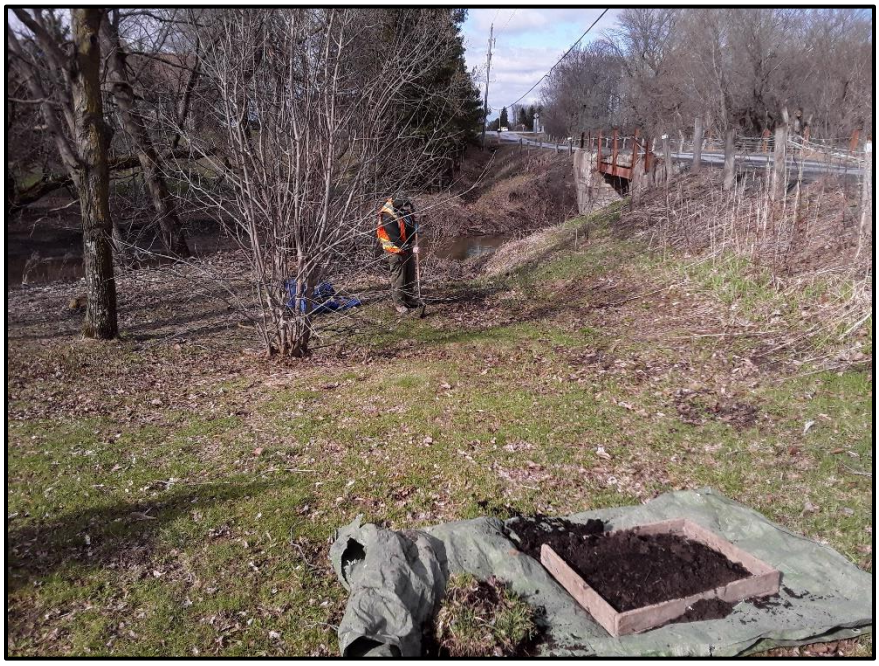


Image 10. View of field crew undertaking shovel test pit survey at 5 m intervals along the edge of Butternut Creek, facing west. (PR21-022D013)

Image 11. View of a sample test pit completed within the manicured lawn south of Paul Latour Road (Route 800), facing west. (PR21-022D011)

Image 12. View of a sample test pit completed along the edge of Butternut Creek, facing west. (PR21-022D016)

APPENDIX 1: Photographic Catalogue

Camera: Panasonic Lumix DMC-TS3

Catalogue No.	Description	Dir.
PR21-022D001	View of field conditions just north of Route 800	NW
PR21-022D002	View of field crew conducting pedestrian survey at 5 m intervals towards the center of the study area	W
PR21-022D003	View of field conditions towards the center of the study area	N
PR21-022D004	View of field crew conducting pedestrian survey at 5 m intervals towards the north end of the study area	SE
PR21-022D005	View of water-logged culvert just south of the ploughed field	E
PR21-022D006	View of water-logged culvert just south of the ploughed field	W
PR21-022D007	View of dense brush south of Route 800	E
PR21-022D008	View of field crew test pitting brush south of Route 800	N
PR21-022D009	View of saturated soils southeast of the Route 800	NE
PR21-022D010	Sample TP001 dug in wooded area south of Route 800	W
PR21-022D011	Sample TP002 dug in manicured lawns south of Route 800	W
PR21-022D012	View of field crew conducting shovel test pit survey at 5 m intervals in manicured lawns	W
PR21-022D013	View of field crew conducting shovel test pit survey along the shore of Butternut Creek	W
PR21-022D014	View of sloped area south of Route 800 and west of Butternut Creek	W
PR21-022D015	Sample TP003 dug along shore of Butternut Creek	W
PR21-022D016	Sample TP003 dug along shore of Butternut Creek	W
PR21-022D017	View of slope north of Route 800 and west of the ploughed field	W
PR21-022D018	View of saturated culvert west of County Road 7	N
PR21-022D019	View of saturated culvert west of County Road 7	N
PR21-022D020	View of field crew conducting pedestrian survey at 5 m intervals	N

APPENDIX 2: Glossary of Archaeological Terms

Archaeology:
The study of human past, both prehistoric and historic, by excavation of cultural material.

Archaeological Sites:
The physical remains of any building, structure, cultural feature, object, human event or activity which, because of the passage of time, are on or below the surface of the land or water.

Archaic:
A term used by archaeologists to designate a distinctive cultural period dating between 8000 and 1000 B.C. in eastern North America. The period is divided into Early (8000 to 6000 B.C.), Middle (6000 to 2500 B.C.) and Late (2500 to 1000 B.C.). It is characterized by hunting, gathering and fishing.

Artifact:
An object manufactured, modified or used by humans.

B.P.:
Before Present. Often used for archaeological dates instead of B.C. or A.D. Present is taken to be 1951, the date from which radiocarbon assays are calculated.

Backdirt:
The soil excavated from an archaeological site. It is usually removed by shovel or trowel and then screened to ensure maximum recovery of artifacts.

Chert:
A type of silica rich stone often used for making chipped stone tools. A number of chert sources are known from southern Ontario. These sources include outcrops and nodules.

Contact Period:
The period of initial contact between Native and European populations. In Ontario, this generally corresponds to the seventeenth and eighteen centuries depending on the specific area. See also Protohistoric.

Cultural Resource / Heritage Resource:
Any resource (archaeological, historical, architectural, artifactual, archival) that pertains to the development of our cultural past.

Cultural Heritage Landscapes:
Cultural heritage landscapes are groups of features made by people. The arrangement of features illustrate noteworthy relationships between people and their surrounding environment. They can provide information necessary to preserve, interpret or reinforce the understanding of important historical settings and changes to past patterns of land use. Cultural landscapes include neighbourhoods, townscapes and farmscapes.

Diagnostic:
An artifact, decorative technique or feature that is distinctive of a particular culture or time period.

Disturbed:
In an archaeological context, this term is used when the cultural deposit of a certain time period has been intruded upon by a later occupation.

Excavation:
The uncovering or extraction of cultural remains by digging.

Feature:
This term is used to designate modifications to the physical environment by human activity. Archaeological features include the remains of buildings or walls, storage pits, hearths, post moulds and artifact concentrations.

Flake:
A thin piece of stone (usually chert, chalcedony, etc.) detached during the manufacture of a chipped stone tool. A flake can also be modified into another artifact form such as a scraper.

Fluted:
A lanceolate shaped projectile point with a central channel extending from the base approximately one third of the way up the blade. One of the most diagnostic Palaeo-Indian artifacts.

Historic:
Period of written history. In Ontario, the historic period begins with European settlement.

Lithic:
Stone. Lithic artifacts would include projectile points, scrapers, ground stone adzes, gun flints, etc.

Lot:
The smallest provenience designation used to locate an artifact or feature.

Midden:
An archaeological term for a garbage dump.

Mitigation:
To reduce the severity of development impact on an archaeological or other heritage resource through preservation or excavation. The process for minimizing the adverse impacts of an undertaking on identified cultural heritage resources within an affected area of a development project.

Multicomponent:
An archaeological site which has seen repeated occupation over a period of time. Ideally, each occupation layer is separated by a sterile soil deposit that accumulated during a period when the site was not occupied. In other cases, later occupations will be directly on top of earlier ones or will even intrude upon them.

Operation:
The primary division of an archaeological site serving as part of the provenience system. The operation usually represents a culturally or geographically significant unit within the site area.

Palaeo-Indian:
The earliest human occupation of Ontario designated by archaeologists. The period dates between 9000 and 8000 B.C. and is characterized by small mobile groups of hunter-gatherers.

Prehistoric:
Before written history. In Ontario, this term is used for the period of Native occupation up until the first contact with European groups.

Profile:
The profile is the soil stratigraphy that shows up in the cross-section of an archaeological excavation. Profiles are important in understanding the relationship between different occupations of a site.

Projectile Point:
A point used to tip a projectile such as an arrow, spear or harpoon. Projectile points may be made of stone (either chipped or ground), bone, ivory, antler or metal.

Provenience:
Place of origin. In archaeology this refers to the location where an artifact or feature was found. This may be a general location or a very specific horizontal and vertical point.

Salvage:
To rescue an archaeological site or heritage resource from development impact through excavation or recording.

Stratigraphy:
The sequence of layers in an archaeological site. The stratigraphy usually includes natural soil deposits and cultural deposits.

Sub-operation:
A division of an operation unit in the provenience system.

Survey:
To examine the extent and nature of a potential site area. Survey may include surface examination of ploughed or eroded areas and sub-surface testing.

Test Pit:
A small pit, usually excavated by hand, used to determine the stratigraphy and presence of cultural material. Test pits are often used to survey a property and are usually spaced on a grid system.

Woodland:
The most recent major division in the prehistoric sequence of Ontario. The Woodland period dates from 1000 B.C. to A.D. 1550. The period is characterized by the introduction of ceramics and the beginning of agriculture in southern Ontario. The period is further divided into Early (1000 B.C. to A.D. 0), Middle (A.D. 0 to A.D. 900) and Late (A.D. 900 to A.D.1550).

APPENDIX C – CONSULTATION MATERIALS

Title	First Name	Last Name	Position	Organization	Address	City	Prov	Postal Code	Telephone	Email
Provincial Agency										
Sir/Madam			Class EA Form	Ministry of Environment, Conservation and Parks						eanotification.eregion@ontario.ca
Mr.	John	Boos	District Supervisor- Kemptville District	Ministry of Natural Resources and Forestry	Unit 1, 10 Campus Drive	Kemptville	ON	K0G 1J0	613-258-8222	john.boos@ontario.ca
Ms.	Karla	Barboza	Team Lead- Heritage, Heritage Planning Unit	Ministry of Heritage, Sport, Tourism and Culture Industries	401 Bay Street	Toronto	ON	M7A 0A7	416-314-7120	karla.barboza@ontario.ca
Ms.	Sarah	Zelcer	Manager, Indigenous Relations Unit	Ministry of Indigenous Affairs	160 Bloor Street, Suite 400	Toronto	ON	M7A 2E6	647-964-4095	sarah.zelcer@ontario.ca
Sir/Madam			Fish and Fish Habitat Protection Program	Fisheries and Oceans Canada Centre for Inland Waters	867 Lakeshore Road	Burlington	ON	L7S 1A1	905-336-4999	info@dfo-mpo.gc.ca
Mr.	Stéphane	Sarrazin	MPP	Glengarry-Prescott-Russell	290A McGill Street	Hawkesbury	ON	K6A 1P8	613-632-2706	Stephane.Sarrazin@pc.ola.org
Mr.	Francis	Drouin	Member of Parliament	Glengarry-Prescott-Russell	993 Notre Dame Street	Embrun	ON	K0A 1W0	613-292-8222	Francis.Drouin@parl.gc.ca
Municipal Agency										
Mr.	Francois	St. Amour	Mayor	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-524-5486 or 613-277-	francois.st-amour@nationmun.ca
Mr.	Danik	Forgues	Councillor- Ward 3	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-222-1510	danik.forgues@nationmun.ca
Ms.	Josée	Brizard	Chief Administrative Officer-Clerk	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-764-5444 X 235	jbrizard@nationmun.ca
Mr.	Guylain	Laflèche	Director, Construction, Planner	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-764-5444 x 229	glafleche@nationmun.ca
Mr.	Marc	Legault	Director of Public Works	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-524-2932 x 202	marclegault@nationmun.ca
Ms.	Stéphane P.	Parisien	Chief Administrative Officer	United Counties of Prescott-Russell	59 Court Street, PO Box 304	L'Orignal	ON	K0B 1K0	613-675-4661 x 2000	spparisien@prescott-russell.on.ca
Mr.	Jérémie	Bouchard	Public Works Interim Director/Engineer	United Counties of Prescott-Russell	59 Court Street, PO Box 304	L'Orignal	ON	K0B 1K0	613-675-4661 x 3501	jbouchard@prescott-russell.on.ca
Emergency Services										
Mr.	Richard	Groulx	Fire Chief/Health and Safety Coordinator	The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-764-5444	rgroulx@nationmun.ca
Inspector	Luc	Duval	Detchment Commander	Ontario Provincial Police - Russell County	411 New York Central Avenue	Embrun	ON	K0A 1W1	613-443-4499	luc.duval@opp.ca
Mr.	Marc-Andre	Periard	Director, Emergency Services	United Counties of Prescott-Russell	584 County Road 9, P.O Box 150	Plantagenet	ON	K0B 1L0	613-673-5139	maperiard@prescott-russell.on.ca
Mr.	Christian	Boudreau	Deputy Chief of Operations	Untied Counties of Prescott-Russell	111 Millennium Parkway	Plantagenet	ON	K0B 1L0	613-673-5139	cboudreau@prescott-russell.on.ca
Indigenous Communities										
Grand Chief	Abram	Benedict	Grand Chief	Mohawk Council of Akwesasne	101 Tewesateni Road	Akwesasne	ON	K6H 0G5	613-575-2250 x 2166	grand.chief@akwesasne.ca
Sir/Madam			Consultation Unit	Métis Nation of Ontario	Suite 1100 - 11th Floor 66 Slater Street	Ottawa	ON	K1P 5H1	613-798-1488	consultations@metisnation.org
Conservation Authority										
Ms.	Alison	McDonald	Team Lead, Approvals	South Nation Conservation	38 Victoria Street, PO Box 29	Finch	ON	K0C 1K0		amcdonald@nation.on.ca
Ms	Michelle	Cavanagh	Team Lead, Stewardship	South Nation Conservation	38 Victoria Street, PO Box 29	Finch	ON	K0C 1K0		mcavanagh@nation.on.ca
Mr.	Geoff	Owens	Regulation Officer	South Nation Conservation	38 Victoria Street, PO Box 29	Finch	ON	K0C 1K0		gowens@nation.on.ca
School Boards/Transportation										
Mr.	Ron	Ferguson	Director of Education	Upper Canada District School Board	225 Central Avenue West	Brockville	ON	K6V 5X1	613-342-0371	ron.ferguson@ucdsb.on.ca
Ms.	Lyne	Racine	Director of Education and Secretary	Conseil scolaire de district catholique de l'Est ontarien	875 County Road 17	L'Orignal	ON	K0B 1K0	613 675-4691	courriel@csdceo.org or email@csdceo.org
Ms.	Laurie	Corrigan	Director of Education	Catholic District School Board of Eastern Ontario	Box 2222, 2755 Highway 43	Kemptville	ON	K0G 1J0	613-258-7757	director@cdsbeo.on.ca
Ms.	Sylvie CR	Tremblay	Director of Education	Conseil des ecoles publiques de l'Est de l'Ontario	2445 Boul. St-Laurent	Ottawa	ON	K1C 6C3	613-742-8960	sylvie.tremblay@cepeo.on.ca
Sir/Madam				Consortium de transport scolaire de l'Est	665 rue Principale	Casselman	ON	K0A 1M0	1-855-689-2873	info@ctse.ca
Sir/Madam				Student Transportation of Eastern Ontario	PO Box 1179, 104 Commerce Drive	Prescott	ON	K0E 1T0	613-925-0022	transportation@steo.ca
Businesses/Residents										
			Direct Mail to residents within 1 km of bridge							
Sir/Madam					[redacted]	Casselman	ON	K0A 1M0		
	[redacted]			St. Albert Storage		Casselman	ON	K0A 1M0	[redacted]	
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
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Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K01 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Sir/Madam						Casselman	ON	K0A 1M0		
Utilities										
Ms.	Jessica	Prézeau		The Nation Municipality	958 Route 500 West	Casselman	ON	K0A 1M0	613-764-5444 x 234	utility@nationmun.ca
Mr.	Doug	Renaud	Director of Water and Wastewater	The Nation Municipality	959 Route 500 West	Casselman	ON	K0A 1M0	613-764-5444 x 300	drenaud@nationmun.ca
Sir/Madam				Bell Canada Municipal Operations Centre	7777 Weston Road	Vaughan	ON	L4L 0G9		
Sir/Madam				Hydro Ottawa	3025 Albion Road North, Box 8700	Ottawa	ON	K1G 3S4	613-738-6400	
Sir/Madam				Rogers Communications	800 York Street	London	ON	N6A 5B1		

Sir/Madam				Hydro One Networks	483 Bay Street South Tower, 8th Floor	Toronto	ON	M5G 2P5		
Sir/Madam				B2B2C Inc.	2700, Michelin Street	Laval	QC	H7L 5Y1	519-336-1829	
Sir/Madam				Multilink Wireless	568 Rte 600 Est #3	Casselman	ON	K0A 1M0	613-764-4441	
Sir/Madam				Eastlink	PO Box 8660, Station A	Halifax	NS	B3K 5M3		
Sir/Madam				TekSavvy	800 Richmond Street	Chatham	ON	N7M 5J5		
Sir/Madam				Xplornet	300 Lockhart Mill Road, PO Box 9060	Woodstock	ON	E7M 6B5	506-328-8853	

McINTOSH PERRY

September 19, 2022

To Whom it May Concern:

Re: Notice of Commencement
Route 800 East Realignment
Municipal Class Environmental Assessment

The Nation Municipality has retained McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) to provide consulting services to complete a Municipal Class Environmental Assessment for an existing bridge (C001) on Route 800 East. The existing bridge (C001) that spans Butternut Creek on Route 800 East has reached the end of its service life. The Municipality is considering various alternative solutions. At this time, the preliminary Technically Preferred Alternative is to close Route 800 East at the bridge and construct a new road alignment to by-pass the creek on the north-east side.

The study is being conducted in accordance with Schedule B of the Municipal Class Environmental Assessment (EA) (October 2000, as amended) process. This notice signals the commencement of the Class EA. The study will confirm and document the existing structural deficiencies and identify alternative solutions. This study will investigate the potential environmental, social and economic impacts of the preferred alternative and identify measures to mitigate any adverse impacts. The environmental impacts of each alternative will be evaluated and in consultation with the public and external agencies, a technically preferred alternative will be selected. Per the requirements of the Schedule 'B' Municipal Class Environmental Assessment, a draft Project File Report has been prepared and is available for viewing on Nation Municipality website: https://nationmun.ca/en/council-staff/announcements-notices.

Public consultation is vital to the success of this study. We want to ensure that anyone interested in this study has the opportunity to get involved and provide input. If you have any questions or comments regarding the study or would like to be included on the mailing list to receive future notices and study updates, please contact one of the Project Team members below. Input received will be incorporated into the planning and design process for this project and will be received until October 19, 2022.

115 Walgreen Road, R.R.3. Carp, ON K0A 1L0 | T. 613-836-2184 | F. 613-836-3742
info@mcintoshperry.com | www.mcintoshperry.com

For further information on this project please contact the following:

Marc Legault
The Nation Municipality
3248 County Road 9
Fournier, ON K0B 1G0
Telephone: 613-524-2932 ext. 202
Email: marclegault@nationmun.ca

Christine Shillinglaw, P.Eng.
McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road, R.R.3
Carp, ON, K0A 1L0
Phone: 613-714-0794
Fax: 613-836-3742
Email: c.shillinglaw@mcintoshperry.com

Pour des renseignements en français au sujet de ce projet, veuillez rejoindre Patrick Leblanc en composant le 613-714-4586 ou par courriel au p.leblanc@mcintoshperry.com.

Information collected will be used in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments become part of the public record. If you have accessibility requirements in order to participate in this project, please contact one of the project team members listed above.

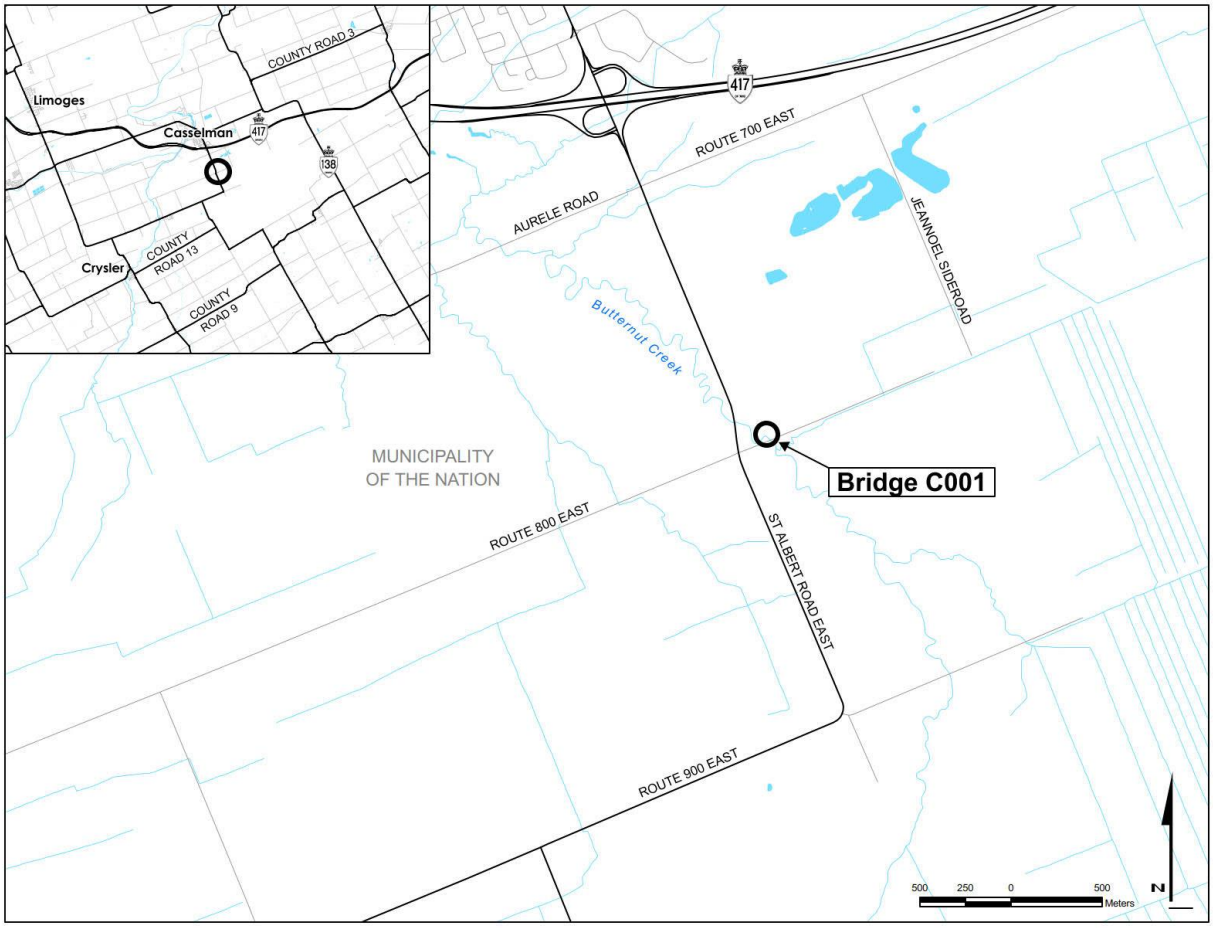
Thank you for your anticipated assistance and cooperation.

Sincerely,

McIntosh Perry Consulting Engineers Ltd.,

Christine Shillinglaw, P.Eng.
Project Manager

Encl. Key Plan


Limoges
Casselman
COUNTY ROAD 3
417
138
COUNTY ROAD 13
Crysler
COUNTY ROAD 9
ROUTE 700 EAST
AURELE ROAD
JEANNOEL SIDEROAD
Butternut Creek
MUNICIPALITY OF THE NATION
Bridge C001
ROUTE 800 EAST
ST ALBERT ROAD EAST
ROUTE 900 EAST
500 250 0 500
Meters
N

Key Plan

McINTOSH PERRY

Le 20 septembre 2022

À qui de droit:

Objet: Avis de début d'étude réalignement de la Route 800 est
Évaluation environnementale de classe municipale

La Municipalité de La Nation a retenu les services de McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) pour fournir des services de consultation afin de réaliser une évaluation environnementale de portée municipale pour un pont existant (C001) sur la route 800 Est.

Le pont existant (C001) qui enjambe le ruisseau Butternut sur la route 800 Est a atteint la fin de sa durée de vie utile. La Municipalité envisage diverses solutions alternatives. À l'heure actuelle, l'alternative techniquement préférée préliminaire consiste à fermer la route 800 Est au pont et à construire un nouveau tracé routier pour contourner le ruisseau du côté nord-est. L'étude est menée conformément à l'annexe B du processus d'évaluation environnementale municipale de portée générale (EE) (octobre 2000, tel que modifié). Cet avis signale le début de l'évaluation environnementale de classe.

L'étude confirmera et documentera les déficiences structurelles existantes et identifiera des solutions alternatives. Les impacts environnementaux de chaque alternative seront évalués et en consultation avec le public et les agences externes, une alternative techniquement préférée sera sélectionnée. Conformément aux exigences de l'évaluation environnementale municipale de portée générale de l'annexe « B », une ébauche du rapport de dossier de projet a été préparée et peut être consultée sur le site Web de la municipalité de la Nation: https://nationmun.ca/en/council-staff/announcements-notices.

La consultation publique est essentielle à la réussite de cette étude. Nous voulons nous assurer que toute personne intéressée par cette étude ait la possibilité de s'impliquer et de fournir des commentaires. Si vous souhaitez participer à cette étude ou recevoir des informations, veuillez contacter l'un des membres de l'équipe de projet identifié ci-dessous. Les commentaires reçus seront intégrés au processus de planification et de conception de ce projet et seront reçus jusqu'au 19 octobre 2022.

115 Walgreen Road, R.R.3. Carp, ON K0A 1L0 | T. 613-836-2184 | F. 613-836-3742
info@mcintoshperry.com | www.mcintoshperry.com

Pour plus d'informations sur ce projet, veuillez contacter :

Marc Legault
La Municipalité de la Nation
Directeur des travaux publics
3248, chemin de comté 9
Fournier, Ontario K0B 1G0
T – 613-524-2932 poste. 202
marclegault@nationmun.ca

Christine Shillinglaw, P.Eng.
McIntosh Perry Consulting Engineers Ltd.
Chef de projet
115, chemin Walgreen
Carpe, Ontario K0A 1L0
T-613-714-0794
c.shillinglaw@mcintoshperry.com

Pour des renseignements en français au sujet de ce projet, veuillez rejoindre Patrick Leblanc en composant le 613-714-4586 ou par courriel au p.leblanc@mcintoshperry.com.

Les renseignements recueillis seront utilisés conformément à la Loi sur l'accès à l'information municipale et la protection de la vie privée. À l'exception des renseignements personnels, tous les commentaires font partie du dossier public. Si vous avez des exigences en matière d'accessibilité pour participer à ce projet, veuillez contacter l'un des membres de l'équipe de projet énumérés ci-dessus.

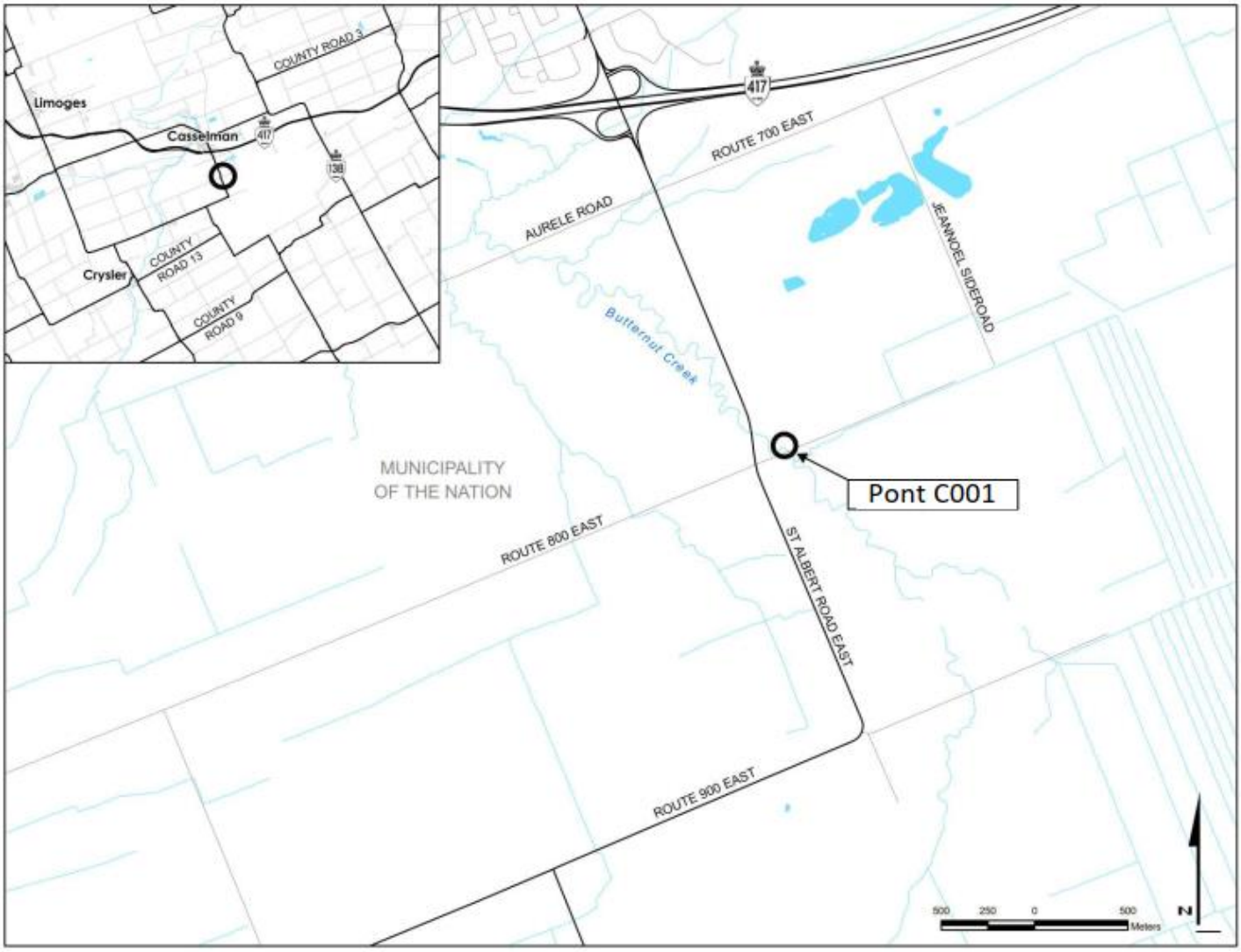
Merci d'avance pour votre assistance et coopération.

Je vous prie d'agréer, Mesdames, Messieurs, mes salutations distinguées,

McIntosh Perry Consulting Engineers Ltd.,

Christine Shillinglaw, P.Eng.
Chef de projet

p.j. Plan de la région à l'étude

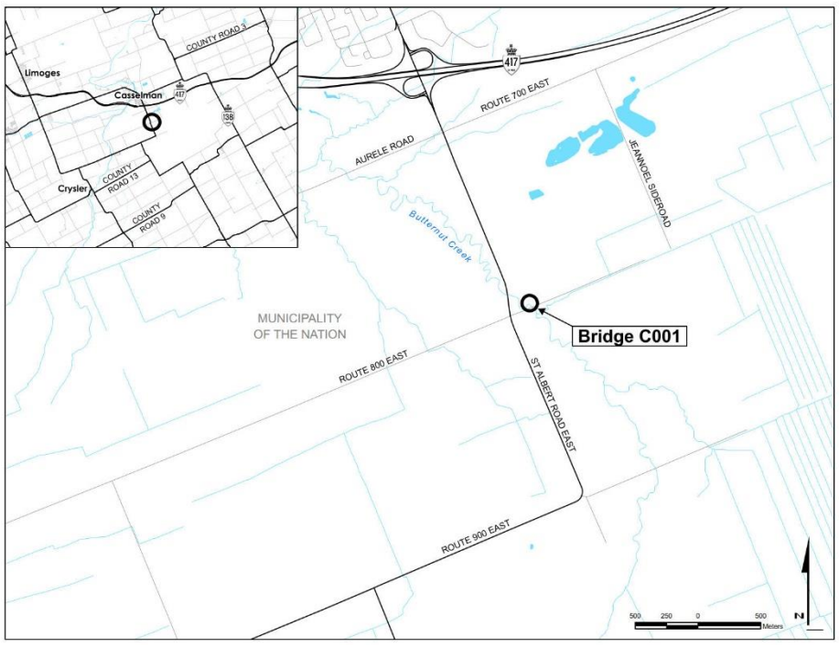


Plan de la region à l'étude

NOTICE OF STUDY COMMENCEMENT
ROUTE 800 EAST REALIGNMENT
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

The Nation Municipality has retained McIntosh Perry Consulting Engineers Ltd. (McIntosh Perry) to provide consulting services to complete a Municipal Class Environmental Assessment for an existng bridge (C001) on Route 800 East.

The existing bridge (C001) that spans Butternut Creek on Route 800 East has reached the end of its service life. The Municipality is considering various alternative solutions. At this time, the preliminary Technically Preferred Alternative is to close Route 800 East at the bridge and construct a new road alignment to by-pass the creek on the north-east side.



The study is being conducted in accordance with Schedule B of the Municipal Class Environmental Assessment (EA) (October 2000, as amended) process. This notice signals the commencement of the Class EA. The study will confirm and document the existing structural deficiencies and identify alternative solutions. The environmental impacts of each alternative will be evaluated and in consultation with the public and external agencies, a technically preferred alternative will be selected. Per the requirements of the Schedule 'B' Municipal Class Environmental Assessment, a draft Project File Report has been prepared and is available for viewing on Nation Municipality website: https://nationmun.ca/en/council-staff/announcements-notices.

Public consultation is vital to the success of this study. We want to ensure that anyone interested in this study has the opportunity to get involved and provide input. If you wish to be involved in this study or receive information, please contact one of the Project Team Members identified below. Input received will be incorporated into the planning and design process for this project and will be received until October 17, 2022.

For further information on this project please contact the following:

Marc Legault, P.Eng
The Nation Municipality
Director of Public Works
3248 County Road 9
Fournier, Ontario K0B 1G0
T – 613-524-2932 ext. 202
marclegault@nationmun.ca

Christine Shillinglaw, P.Eng
McIntosh Perry Consulting Engineers Ltd.
Project Manager
115 Walgreen Road
Carp, Ontario K0A 1L0
T – 613-714-0794
c.shillinglaw@mcintoshperry.com

Pour des renseignements en français au sujet de ce projet, veuillez rejoindre Patrick Leblanc en composant le 613-714-4586 ou par courriel au p.leblanc@mcintoshperry.com.

Information collected will be used in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments become part of the public record. If you have accessibility requirements in order to participate in this project, please contact one of the project team members listed above.

This notice was first issued on September 19, 2022

APPENDIX D – CONSULTATION COMMENTS/RESPONSES