

**FINAL**

United Counties of Leeds and Grenville

# **Four Lane Upgrade of County Road 43, Kemptville Corridor**

## **Environmental Study Report ADDENDUM**

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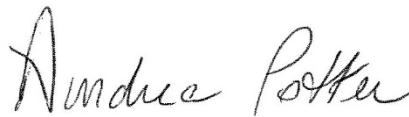
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# Executive Summary

## Background

In 2010, the United Counties of Leeds and Grenville completed a Schedule 'C' Municipal Class Environmental Assessment (EA) to facilitate improvements to County Road 43 from Somerville Road in the west to the MTO boundary of Highway 416 in the east and documented the process in the *Four Lane Upgrade of County Road 43, Kemptville Corridor Environmental Study Report* (ESR) (AECOM, 2010). The 2010 Recommended Plan included a widening of County Road 43 to four lanes, rehabilitation of the existing 2-lane concrete bridge and construction of a second 2-lane structure to the south of the existing bridge.

In 2020, AECOM was retained by the United Counties of Leeds and Grenville to complete the detailed design for the four-lane widening of County Road 43 for the segment extending from 200 metres west of County Road 44 to 220 metres east of Colonnade Drive in Kemptville, Ontario.

## Class EA Addendum Process

The Class (EA) is a planning process that has been approved under the Ontario Environmental Assessment Act (OEAA) for a class or group of undertakings. A Class EA follows an approved process designed to protect the environment and to ensure compliance with the OEAA. Projects that are identified in the Class EA can proceed to implementation without further approval under the Act provided that the approved Class EA planning process is followed.

In accordance with the Municipal Class EA an Addendum is required when there are any significant changes to the project or change in the environmental setting which occurs after the filing of the ESR and / or the period of time from the filing of the Notice of Completion to the proposed commencement of construction exceeds ten (10) years. In these instances, a review of the planning and design process is required to ensure the project and the mitigation measures are still valid given the current planning context.

For the subject project, due to the time lapse period between the filing of the 2010 ESR and the initiation of detailed design in 2020 an Addendum to the ESR is required in accordance with the Municipal Class Environmental Assessment process. The time lapse from completion of the EA to initiation also provided the opportunity to review the 2010 Recommended Plan and determine if changes to the design could improve the project with the support of stakeholders.

This Addendum summarizes the circumstances necessitating the reconsideration and documents the updates to the environmental existing conditions, the changes made to the design since 2010, the updated potential for impact, and the mitigation measures recommended to minimize impacts. The recent consultation associated with the addendum process is also included.

While a Notice of Filing an Addendum will be issued providing a 30-day review period, which will include opportunity to request the Minister of the Environment, Conservation and Parks for an order requiring a higher level of study, it is important to clarify that only the proposed changes to the recommended plan are open for review/comment and not the previously issued ESR.

## Public Consultation

An agency and public consultation program was completed seeking input from residents, Aboriginal communities, agencies, ministries, municipalities, authorities, and community stakeholders at project commencement, public consultation and finally to advise them of project completion and the filing of this Addendum. They were encouraged to provide comments and input throughout the project. Public and agency input was received and incorporated into this Addendum where appropriate.

## 2021 Recommended Design

The changes and updates made to the Recommended Plan since filing of the 2010 ESR are summarized in **Table E1** below.

The project activities will result in some permanent and temporary construction impacts. Impacts to the natural environment will be restored and enhanced following construction completion. Compensation for loss of wetland and aquatic habitat will significantly exceed the losses. While the Project will have temporary impacts and minor permanent impacts to fish habitat, wetland communities and Significant Wildlife Habitat, the net effect of the Project will be a net gain in fish habitat, wetland communities, Species at Risk and Significant Wildlife Habitat.

Environmental commitments will be incorporated into the detail design and contract documents as appropriate so that contractors are aware of the requirements prior to tendering. Monitoring construction activities must ensure that all environmental standards and commitments for construction are met.

**Table E1: Summary of Changes and Updates to the 2010 ESR Design**

2010 Proposed Corridor Design	2021 Proposed Corridor Design	Rationale for Change
<ul style="list-style-type: none"> <li>• 4-lane urban cross-section</li> <li>• 1.5 metre cycle track</li> <li>• 2 metre sidewalk</li> </ul>	<ul style="list-style-type: none"> <li>• 4-lane urban cross-section</li> <li>• 3 metre multi-use pathway</li> </ul>	<ul style="list-style-type: none"> <li>• The County Road 43 corridor has the majority of residential properties on the south side.</li> <li>• A one-way cycle track would require additional roadway crossings for the majority of recreational users.</li> <li>• The potential high recreational use of the cycling facilities would benefit with a two-way multi-use pathway on both sides of the roadway.</li> </ul>
<ul style="list-style-type: none"> <li>• 5 proposed new roundabouts               <ul style="list-style-type: none"> <li>• County Road 44</li> <li>• Shoppers Drug Mart</li> <li>• James Street / St. Michael's Catholic High School</li> <li>• Anniversary Way</li> <li>• Riverview Lane</li> <li>• Reconstruction of the County Road 19 roundabout from a two-lane to a four-lane roundabout</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 4 proposed new roundabouts               <ul style="list-style-type: none"> <li>• County Road 44</li> <li>• Shoppers Drug Mart</li> <li>• Anniversary Way</li> <li>• Stinson / Retirement Home</li> <li>• Reconstruction of two County Road 43 roundabouts at County Road 19 and at Colonnade Drive</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• With the roundabout at the Community Square/Shoppers Drug Mart access in such close proximity to James St and the high school access, it was recommended that this roundabout be removed. Property requirements are also reduced with this access arrangement. The eastbound left turn into the high school remains.</li> <li>• James Street has limited traffic volumes and the majority of the turning movements will be accommodated at the adjacent roundabout.</li> <li>• A roundabout at Riverview Lane would have an impact on the wetlands and the existing embankments are unstable. Full turning movements are</li> </ul>

		accommodated at either of the adjacent roundabouts.
<ul style="list-style-type: none"> <li>Roundabout at County Road 44</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Add a northbound right turn lane.</li> <li>Add pedestrian switchbacks for pedestrian safety crossing County Roads 43 and 44.</li> </ul>	<ul style="list-style-type: none"> <li>The northbound through movement is a moderate volume, and the northbound right turn cut-off lane was chosen to provide for the northbound right turn in its own lane to restrict the ability for northbound right turning vehicles to manoeuvre into the northbound through lane within the roundabout.</li> <li>Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at Shoppers Drug Mart</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Add pedestrian switchbacks for pedestrian safety crossing County Road 43.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at James Street and entrance to St Michaels High School</li> </ul>	<ul style="list-style-type: none"> <li>No proposed roundabout</li> <li>Access for southbound left and westbound left movement are accommodated at the Shoppers roundabout. Westbound left movement from James Street is accommodated at the Anniversary Way roundabout.</li> </ul>	<ul style="list-style-type: none"> <li>The previous 2010 EA provided a roundabout at the High School entrance. As part of this review, an analysis of the turning movements and traffic demands to and from the high school access and James Street was undertaken. With the roundabout at the Community Square/Shoppers Drug Mart access in such close proximity to James St and the high school access, it was recommended that this roundabout be removed. Property requirements are also reduced with this access arrangement. The eastbound left turn into the high school remains.</li> </ul>

		<ul style="list-style-type: none"> <li>James Street has limited traffic volumes and the majority of the turning movements will be accommodated at the adjacent roundabout. James Street was also realigned slightly to improve intersection geometry.</li> </ul>
<ul style="list-style-type: none"> <li>Roadway between James Street and King Street</li> </ul>	<ul style="list-style-type: none"> <li>No centre median between James Street and Anniversary Way.</li> <li>Provide 5th two-way left lane for access.</li> </ul>	<ul style="list-style-type: none"> <li>The roadway cross-section between James Street and King Street allows for full access by implementing a “fifth-lane” design. This fifth-lane design allows for all northbound left turning movements exiting the commercial land uses to be accommodated in a two-stage movement.</li> <li>The traffic operations were evaluated along this corridor with the fifth-lane design. The proposed design will allow for a future raised median to be constructed and controlled left turn lanes implemented if traffic volumes and traffic operational considerations warrant a change to the cross-section in the future once the adjacent land uses are consolidated or redevelopment occurs. This raised median would require land uses to consolidate accesses to provide a number of westbound left turn lanes within the reconstructed center raised median.</li> <li>With the potential of redevelopment of the commercial along the south side in this segment, it is recommended that an operational traffic analyses be undertaken within the five year timeframe to ensure that all traffic movements to and from the commercial land uses can be safely accommodated.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at Anniversary Way</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Entry and exit alignments adjusted.</li> </ul>	<ul style="list-style-type: none"> <li>The north approach to the Kinderwood Trail and Anniversary Park has been</li> </ul>

	<ul style="list-style-type: none"> <li>• Add pedestrian switchbacks for pedestrian safety crossing County Road 43.</li> </ul>	<p>designed as a full roadway cross-section to accommodate users of the municipal facilities. The roundabout geometry has been revised based on current acceptable design standards.</p> <ul style="list-style-type: none"> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at Stinson and Retirement Home</li> </ul>	<ul style="list-style-type: none"> <li>• Shift proposed roundabout at Riverview Lane easterly to the Stinson / Retirement home.</li> <li>• Add a pedestrian switchback for pedestrian safety crossing County Road 43.</li> </ul>	<ul style="list-style-type: none"> <li>• A roundabout at Riverview Lane would have an impact on the wetlands and the existing embankments are unstable.</li> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Rehabilitate existing 2-lane concrete bridge</li> <li>• Construct second 2-lane structure to the south of the existing bridge</li> </ul>	<ul style="list-style-type: none"> <li>• Replace existing 2-lane bridge with new 4-lane bridge extending to the south</li> </ul>	<ul style="list-style-type: none"> <li>• The age of the bridge, site investigations, life cycle costing, bridge condition survey and structural evaluation led to the decision to build a new 4-lane bridge rather than rehabilitate the existing bridge.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at County Road 19 / Rideau River Road</li> </ul>	<ul style="list-style-type: none"> <li>• Widen centre median between Stinson roundabout and County Road 19 roundabout to accommodate potential future left turn lanes.</li> <li>• Add exclusive southbound and northbound left turn lanes.</li> <li>• Add pedestrian switchbacks for pedestrian safety crossing County Roads 43 and 19.</li> </ul>	<ul style="list-style-type: none"> <li>• A full raised center median will be constructed between Kemptville Retirement Living and County Road 19, with all access within this corridor section operating as right-in / right-out movements. Full movements are accommodated at the Kemptville Retirement Living and County Road 19 roundabouts. The center median has been designed to allow for a future left turn opening if and when future developments on the south side warrant and can safely</li> </ul>

		<p>accommodate these movements within this section of the corridor.</p> <ul style="list-style-type: none"> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at Colonnade Drive</li> </ul>	<ul style="list-style-type: none"> <li>• Modified the geometric design of roundabout to current standards.</li> </ul>	<ul style="list-style-type: none"> <li>• The added northbound and southbound lanes have been added to the roundabout due to the additional traffic demands generated from the new Urbandale residential development on County Road 19 immediately north of the MacEwen's Gas Bar.</li> </ul>
<ul style="list-style-type: none"> <li>• Property Requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Minor adjustments to property requirements. Minimized the need for some parts of private residential and commercial properties.</li> </ul>	<ul style="list-style-type: none"> <li>• The design changes of the County Road 43 corridor resulted in less property being required at residential and commercial properties.</li> </ul>

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# 1. Introduction and Background

In 2010, the United Counties of Leeds and Grenville completed a Schedule 'C' Municipal Class Environmental Assessment (MCEA) to facilitate improvements to County Road 43 from Somerville Road in the west to the MTO boundary of Highway 416 in the east and documented the process in the *Four Lane Upgrade of County Road 43, Kemptville Corridor Environmental Study Report (ESR)* (AECOM, 2010). The 2010 Recommended Plan included a widening of County Road 43 to four lanes, rehabilitation of the existing 2-lane concrete bridge and construction of a second 2-lane structure to the south of the existing bridge.

In 2020, AECOM was retained by the United Counties of Leeds and Grenville to complete the detailed design for the four-lane widening of County Road 43 for the segment extending from 200 metres west of County Road 44 to 220 metres east of Colonnade Drive in Kemptville, Ontario, as illustrated in **Figure 1**.

**Figure 1: Study Area**



The original ESR was filed in 2010; however, the project was not implemented until 2020. Due to the time lapse between the filing of the 2010 ESR and the initiation of detailed design in 2020 an Addendum to the ESR is required in accordance with the Municipal Class Environmental Assessment (MCEA) process.

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## 2. Purpose of the Addendum

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### **2.1.1 Need for an Addendum**

The Class EA is a planning process that has been approved under the Ontario Environmental Assessment Act (OEAA) for a class or group of undertakings. A Class EA follows an approved process designed to protect the environment and to ensure compliance with the OEAA. Projects that are identified in the Class EA can proceed to implementation without further approval under the Act provided that the approved Class EA planning process is followed.

In accordance with the MCEA an Addendum is required when there are any significant changes to the project or change in the environmental setting which occurs after the filing of the ESR and / or the period of time from the filing of the Notice of Completion to the proposed commencement of construction exceeds ten (10) years. In these instances, a review of the planning and design process is required to ensure the project and the mitigation measures are still valid given the current planning context.

For the subject project, the time lapse from completion of the EA to initiation also provided the opportunity to review the 2010 Recommended Plan and determine if changes to the design could improve the project with the support of stakeholders. A summary of the changes made to the roadway and bridge design are outlined in Section 9 of this Addendum.

### **2.1.2 What is included in the Addendum**

In accordance with the MCEA process, this Addendum summarizes the circumstances necessitating the reconsideration and documents the updates to the environmental existing conditions, the changes made to the design since 2010, the updated potential for impact, and the mitigation measures recommended to minimize impacts. The recent consultation associated with the addendum process is also included.

While a Notice of Filing an Addendum will be issued providing a 30 day review period which will include opportunity to request a Part II Order it is important to clarify that only the proposed changes to the recommended plan are open for review/comment and not the previously issued ESR.

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## 3. Existing Conditions Update

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This section of the report provides an update to the existing conditions of the study area environment (i.e. natural, socio-economic, and cultural) with the goal of defining the current environmental setting and planning context.

### 3.1 Technical Environment

The technical conditions within the study area that were reviewed and updated include the bridge condition, utilities, municipal services and geotechnical investigations.

#### 3.1.1 Bridge Condition Assessment

##### Underwater Investigation – Kemptville Creek Bridge

AECOM was retained to undertake an underwater investigation of the Kemptville Creek Bridge in May 2020. This was a follow up to the previously conducted underwater investigation performed by another consultant in 2013. The purpose of the inspection was to visually assess the condition of the submerged portion of the substructure and to monitor the progression of deterioration observed in 2013. The visual and tactile underwater inspection was performed by certified divers from O.D.S. Marine while under the direct supervision of a structural engineer from AECOM who was in continuous visual and voice contact with the diver. The Underwater Investigation report is provided in **Appendix C**.

The visual and tactile underwater inspection of the submerged portions of the abutment walls and pier identified locations of spalling and delamination in the abutment walls and pier. The location of most of the deterioration is at the corners of the abutment walls and the ends of the pier. The remainder of the substructures are in relatively satisfactory condition. It was determined that due to the observed condition, the inherent redundant nature of the rigid frame, and ability for load redistribution, that a load posting for this structure is not required at this time.

However, repairs should be undertaken within 2 years. If repairs have not been undertaken within 2 years, it is then recommended that an underwater investigation be performed in 2 years (i.e. summer 2022) in order to monitor the underwater deterioration.

##### Bridge Condition Assessment and Preliminary Design Report

A Preliminary Design Report was prepared in September 2020 and is provided in **Appendix D** of this Addendum. As part of the preliminary design, a detailed bridge condition survey and structural evaluation was undertaken which is summarized in the preliminary design report.

The Detailed Bridge Condition Survey of the Kemptville Creek Bridge was carried out by Bridge Check Canada Ltd. (BCC) in June 2020 under direction from AECOM. The bridge condition survey was done in accordance with the Ministry of Transportation of Ontario (MTO) Structural Rehabilitation Manual (2007). BCC utilized a Bridge Master (a truck mounted with suspended platform) to perform an up-close inspection of the deck soffit, abutments, pier and wing walls. On the deck, BCC performed a half-cell survey and took corrosion potential measurements. Several concrete cores were taken on the deck areas to test the chloride content, air-void content and compressive strengths. Asphalt sawn samples from the deck were also taken for testing.

Field investigation was also conducted using Ground Penetration Radar (GPR) concrete scanning, and limited concrete removal on the deck, abutments, pier and wingwalls, to measure reinforcing bar sizes, spacing and cover.

Samples of the reinforcement were obtained for tensile strength tests, and concrete cores from the deck and wingwalls were tested for compressive strength.

The detailed bridge condition survey report is provided in **Appendix E** of this Addendum.

The structural evaluation of the Kemptville Creek bridge was done in accordance with the evaluation section (s.14) of the Canadian Highway Bridge Design Code, S6-19 (CHBDC). Only the original General Arrangement of the bridge is available, and dimensions are difficult to read. Structure dimensions not provided on the rehabilitation drawings were measured on site during the Detailed Condition Survey, where possible. All dimensions not possible to measure onsite were scaled from the existing drawing to approximate for the purpose of analysis. The dimensions scaled from the drawing included abutment and pier heights from soffit to top of footing, thickness of abutment at top of footing, and thickness of abutment at top of deck. The intent of the structural evaluation is to evaluate the capacity of the bridge according to the CHBDC and determine if any load posting or strengthening is required.

Based on the analysis of the existing Kemptville Creek Bridge and considering CHBDC's Load Combinations ULS 1- 4 the structure was found to have capacity to support normal vehicular traffic loading along with the expected temperature range.

The bridge evaluation found that none of the loading combinations associated with traffic loads caused the structure to be overloaded. The bridge evaluation is dependent on a damaged concrete section being repaired to original design dimensions. No load posting of the bridge is required if maintenance/repair work is undertaken. Details of the analysis are provided in the Preliminary Design Report in **Appendix D**

### **3.1.2 Utilities and Municipal Services**

The utilities in the area include Hydro One, Enbridge Gas, Bell Canada and Cogeco. During detail design, the utility companies were consulted to coordinate the relocation requirements of underground and overhead services within the construction limits. Liaison with the Municipality of North Grenville also occurred to coordinate the location of the existing underground sanitary sewers, forcemains and watermains.

### **3.1.3 Geotechnical Investigations**

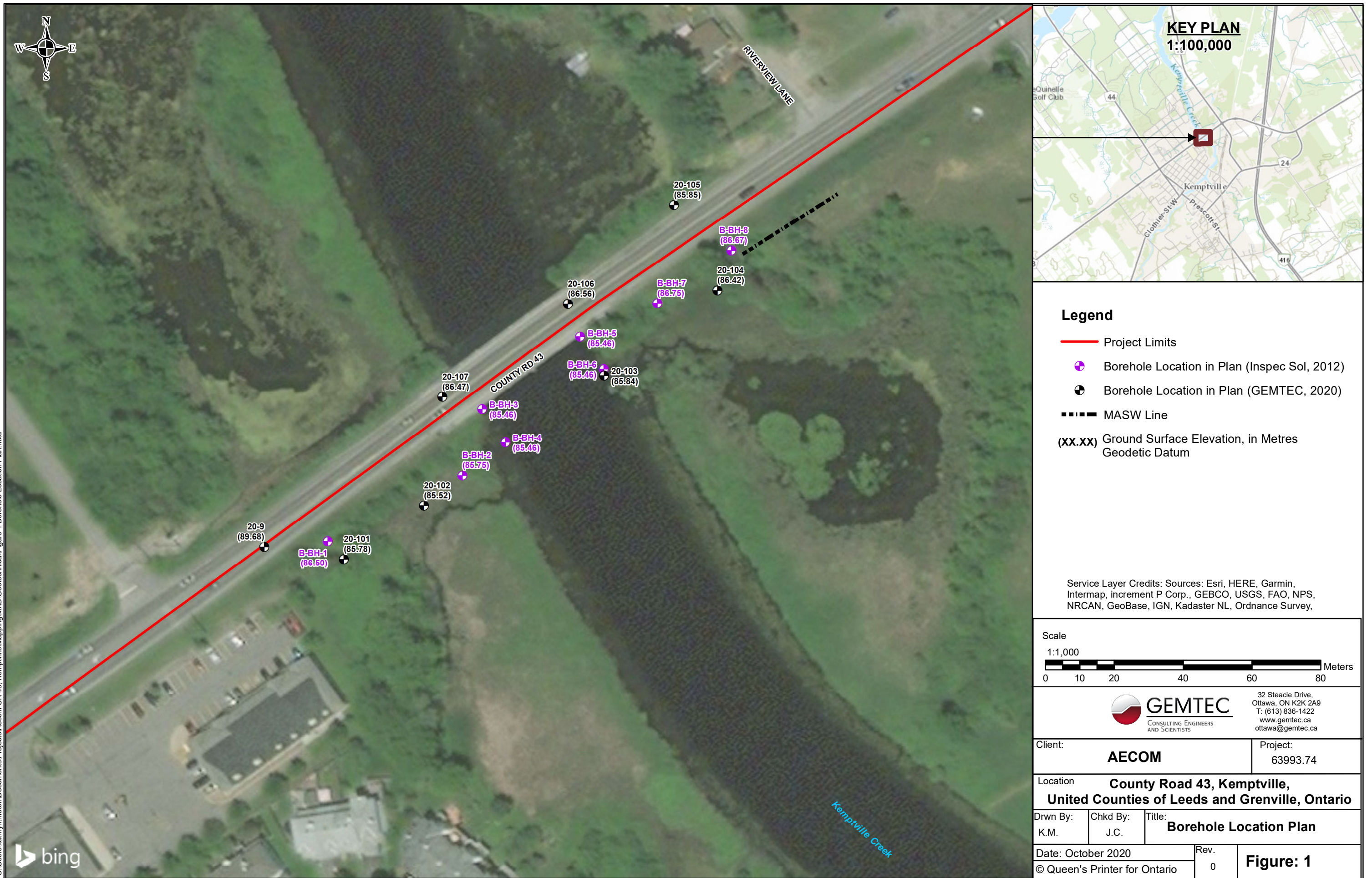
#### Geotechnical and Hydrogeological Investigation

Geotechnical and Hydrogeological Investigation was completed by GEMTEC Consulting Engineers and Scientists Limited in 2021. The purpose of the subsurface investigation was to provide recommendations on the geotechnical design aspects of the project including construction considerations. A copy of the report is provided in **Appendix F** of this Addendum.

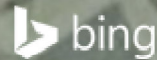
A previous geotechnical investigation report of the bridge foundation and slope stability was completed by GHD (formerly Inspec-Sol Inc.) in 2012 and was considered as part of the study undertaken by GEMTEC in 2020. A copy of the report is provided in **Appendix G** of this Addendum.

GEMTEC geotechnical investigations were carried out in July and August of 2020. Eight boreholes were advanced as illustrated on **Figure 2**. The figure also includes the borehole locations from the previous 2012 study. Hydrogeological testing was also carried out in September 2020 in the well screens installed in the boreholes. The figure also indicates where boreholes were located during the 2012 investigations.

Figure 2: Bridge Borehole Location Plan



C:\Users\kathryn.maton\Documents\Projects\Aecom CR 43 - Kemptville\Mapping\MXD\Geotechnical\Figure 1 Borehole Location Plan.mxd



The investigation found that the south side of Kemptville Creek consisted of a topsoil layer of 50 mm to 100 mm. This is followed by fill material with a thickness of approximately 4.1 m, described as brown silty sand with trace gravel. Clayey silt with organics were also encountered below topsoil with a thickness of approximately 1.2 m to 2.9 m. This was followed by a layer of silty clay crust (approximately 0.2 m to 0.8 m in thickness) and glacial till at a depth of approximately 2.4 m to 6.9 m below ground surface. Grey limestone bedrock was encountered at approximately 6.9 m below ground surface.

The north side of Kemptville Creek consisted of a topsoil layer of 30 mm. This is followed by fill material to a depth of 3.1 m to 3.5 m, described as brown silty sand to sand and gravel. Clayey silt with organic deposits were also encountered to a depth of 3.1 m. This was followed by a glacial till deposit with a thickness of 0.5 m to 0.9 m, described as silty sand with trace gravel. Grey limestone bedrock was encountered between 3.5 m to 4.3 m below ground surface. MNR's Land Information Ontario (LIO) GeoHub Soil Survey Complex database indicates that the soil within the GSA is non-stony. The south side of Kemptville Creek primarily consists of uplands (Class B and C) and St. Samuel (Class B and C) soil types. The banks of Kemptville Creek are non-stony bottomland (Class B and C). The north side of Kemptville Creek primarily consists of St. Samuel (Class b), Vaudreuil (Class B), Rubicon (Class B and C), and uplands (Class B and C) soil types.

The hydraulic conductivity testing concluded that the data collected at the sites are considered representative of literature values for silty clay, clayey silt and fractured limestone.

Based on the results of the seismic testing at the site, the proposed bridge can be designed for Seismic Site Class B. There is no potential for liquefaction of the overburden deposits at this site.

During excavation work and the results of the hydraulic testing indicate that the bedrock at the site is highly permeable and substantial groundwater inflow from the bedrock should be expected. It should be noted that the groundwater levels measured at the site suggest that the bedrock may be hydraulically connected to Kemptville Creek.

For excavations extending to the bedrock surface, it will be necessary to lower the groundwater levels in the bedrock to the base of the excavation in advance of construction. As an example, this could be achieved by pumping from regularly spaced wells completed in bedrock. During construction, pumping from sumps within the excavation will also likely be required.

#### Geotechnical Investigation Pavement Design

Geotechnical investigations were completed by GHD (formerly Inspec-Sol Inc.) in 2021 to determine the pavement conditions along County Road 43 corridor. A copy of the report is provided in **Appendix H** of this Addendum.

Field work was carried out in 2012. Ten boreholes were advanced along the roadway and twenty-four off-road boreholes were advanced to obtain information regarding subgrade conditions for the areas where road embankment widening will occur. Five monitoring wells were installed to collect water level data in 2013. Borehole and monitoring well locations are illustrated on **Figures 3 to 9**.

Soil conditions for the ten boreholes on the roadway consisted of surficial coverings of asphalt pavement, overlying sand and gravel basecourse materials over fill or native soils. Soils conditions within the embankment widening boreholes consisted mainly of a thin layer of topsoil overlying sand and gravel materials. Larger surficial coverings of topsoil were found north of County Road 43 between James Street and Anniversary Way. It was determined that all subgrade conditions for new embankment widening will likely consist of a sand to silty sand. A glacial till subgrade, may be encountered from Rideau Street, east towards James Street in widening areas, containing occasional cobbles and boulders.

Based on the subsurface conditions encountered in the boreholes, and assuming them to be representative of the subsurface conditions across the Site, the following recommendations are provided. The most significant geotechnical considerations for the proposed project are:


- Preparation of Subgrades | All subgrades must consist of native undisturbed soils free of organics. This includes subgrades below future fill embankments. Subgrades should be reviewed and approved by the geotechnical personnel prior to covering.
- Loose to Very Loose Sands | Loose to very loose sand materials in wet conditions were encountered below embankment fills, east of Kemptville Creek. Subgrades in these areas may benefit from and/or require use of geotextiles or coarse material prior to placement of new embankment materials.
- Bridge Transition Areas | The transition areas on the east and west side of Kemptville Creek may need special treatments of subgrade preparation if new fill footprint spreads into wetlands.
- Frost Tapers | Some allowance should be made for frost tapers to be incorporated into the transition of new embankment widening and existing embankment fill, depending on the proposed fill materials and final condition of all embankment areas during construction. Construction of frost tapers should be according to Ontario Provincial Standards.

Figure 3: Corridor Borehole and Monitoring Well Location Plan - 1



Source: AECOM Canada Ltd; Coordinate System: NAD 1983 UTM Zone 18N

**Legend**

-  HBH-X
-  BH-x
-  MW-x



**SITE LOCATION MAP**

**BOREHOLE LOCATION PLAN**  
**KEMPTVILLE CORRIDOR WIDENING**  
**COUNTY ROAD 43**  
**COUNTY ROAD 44 TO COLONNADE DEVELOPMENT**  
 Dwg. No. T020613-A2-2.1

Figure 4: Corridor Borehole and Monitoring Well Location Plan - 2



Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

Legend

-  HBH-X
-  BH-x
-  MW-x



SITE LOCATION MAP



BOREHOLE LOCATION PLAN  
 KEMPTVILLE CORRIDOR WIDENING  
 COUNTY ROAD 43  
 COUNTY ROAD 44 TO COLONNADE DEVELOPMENT  
 Dwg. No. T020613-A2-2.2

Figure 5: Corridor Borehole and Monitoring Well Location Plan - 3



Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

**Legend**

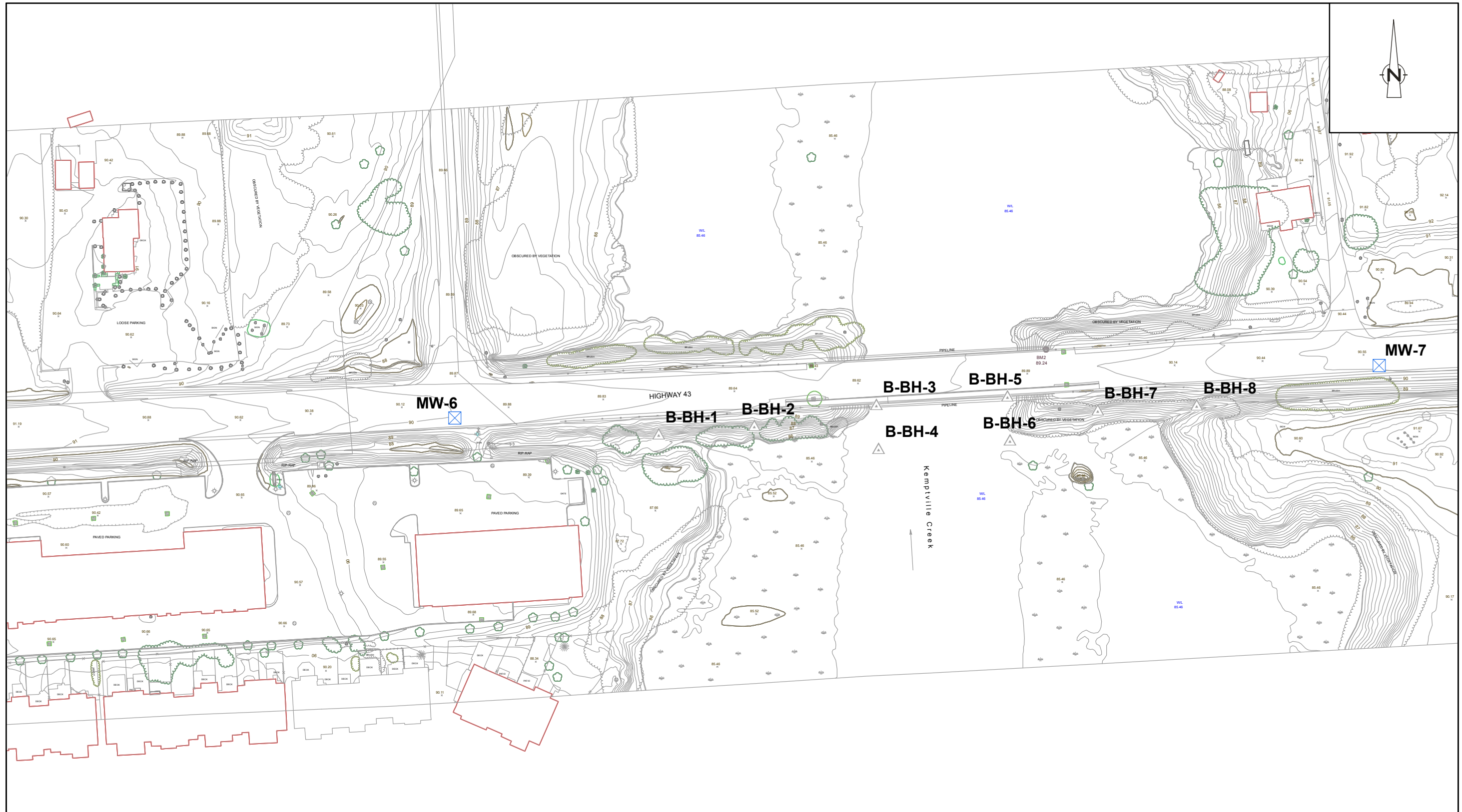
-  HBH-X
-  BH-x



**SITE LOCATION MAP**

**BOREHOLE LOCATION PLAN**  
**KEMPTVILLE CORRIDOR WIDENING**  
**COUNTY ROAD 43**  
**COUNTY ROAD 44 TO COLONNADE DEVELOPMENT**  
*Dwg. No. T020613-A2-2.3*



Figure 6: Corridor Borehole and Monitoring Well Location Plan - 4



Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

SITE LOCATION MAP

**Legend**

-  MW-x - On Road Monitoring Well
-  B-BH-x \*Discussed in T020613-A4

BOREHOLE LOCATION PLAN  
 KEMPTVILLE CORRIDOR WIDENING  
 COUNTY ROAD 43  
 COUNTY ROAD 44 TO COLONNADE DEVELOPMENT  
 Dwg. No. T020613-A2-2.4






Figure 7: Corridor Borehole and Monitoring Well Location Plan - 5



Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

**Legend**

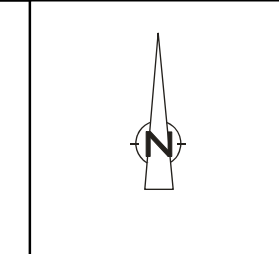
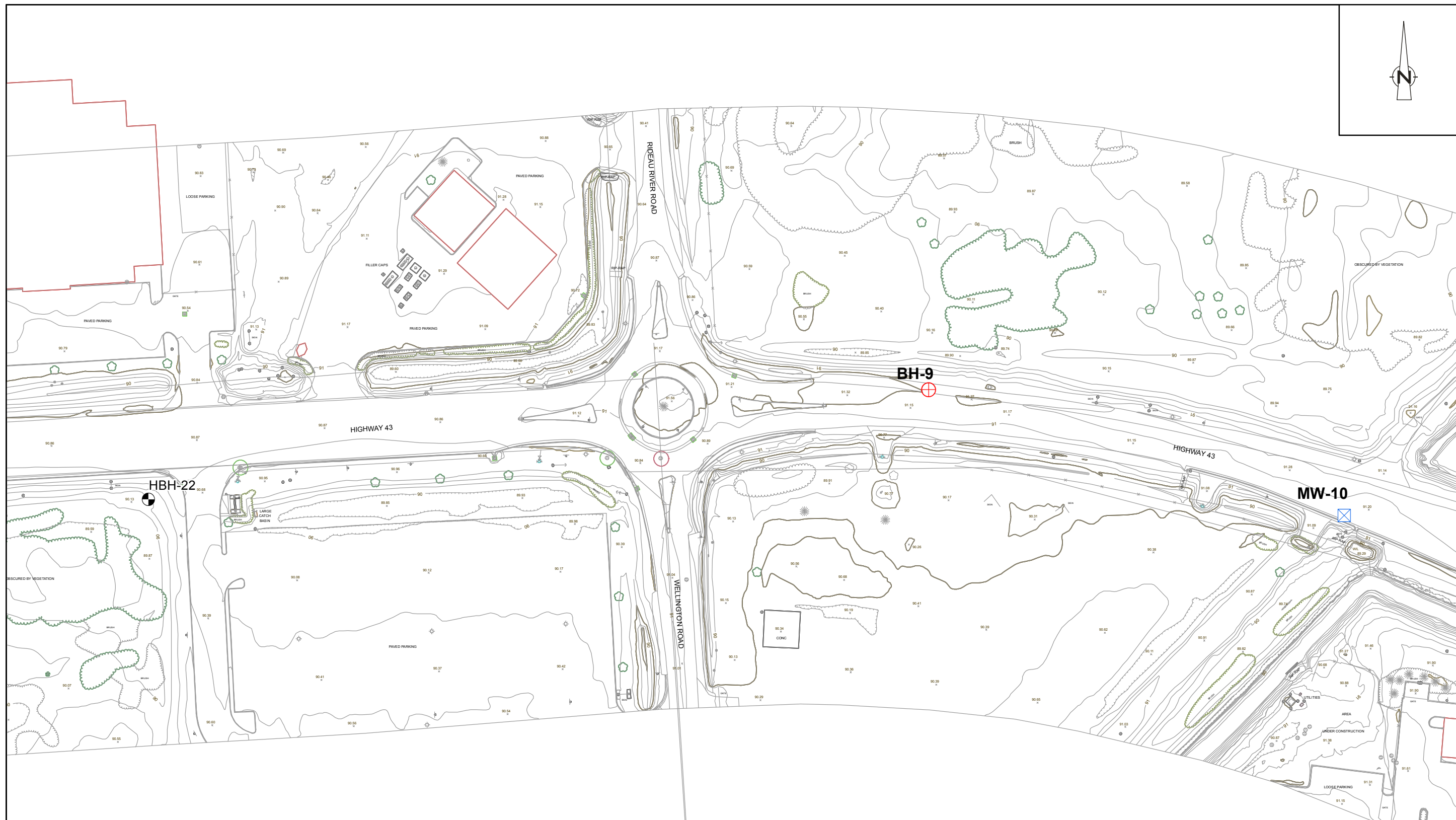
-  HBH-x - Off Road Borehole
-  BH-x - On Road Borehole
-  MW-x - On Road Monitoring Well



**SITE LOCATION MAP**

**BOREHOLE LOCATION PLAN**  
**KEMPTVILLE CORRIDOR WIDENING**  
**COUNTY ROAD 43**  
**COUNTY ROAD 44 TO COLONNADE DEVELOPMENT**  
 Dwg. No. T020613-A2-2.5




Figure 8: Corridor Borehole and Monitoring Well Location Plan - 6



Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

SITE LOCATION MAP

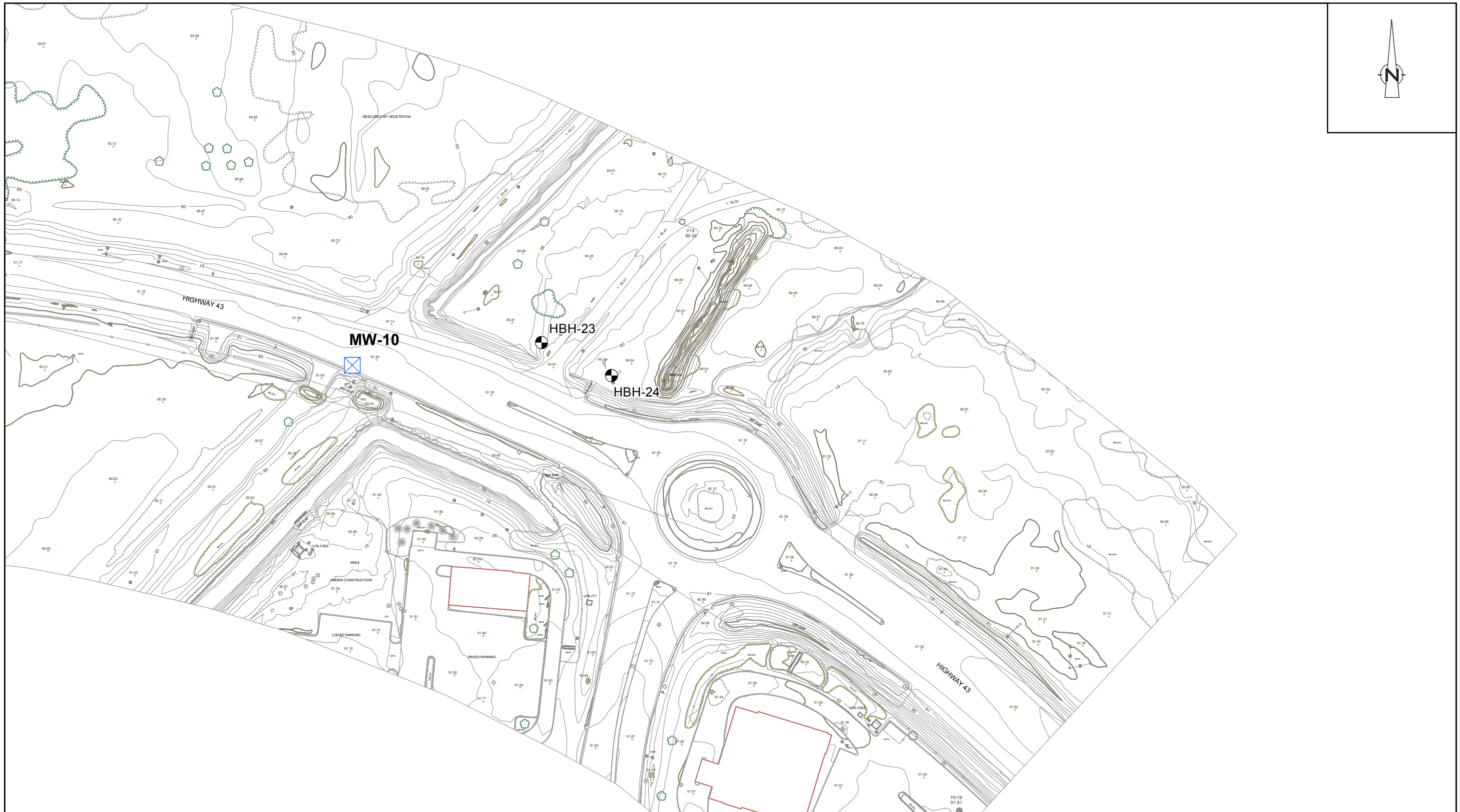
Legend

-  HBH-x - Off Road Borehole
-  BH-x - On Road Borehole
-  MW-x - On Road Monitoring Well

BOREHOLE LOCATION PLAN  
 KEMPTVILLE CORRIDOR WIDENING  
 COUNTY ROAD 43  
 COUNTY ROAD 44 TO COLONNADE DEVELOPMENT  
 Dwg. No. T020613-A2-2.6



Figure 9: Corridor Borehole and Monitoring Well Location Plan - 7





Source: AECOME Canada Ltd.; Coordinate System: NAD 1983 UTM Zone 18N

SITE LOCATION MAP



**Legend**

-  HBH-x - Off Road Boreholes
-  MW-x - On Road Boreholes

BOREHOLE LOCATION PLAN  
 KEMPTVILLE CORRIDOR WIDENING  
 COUNTY ROAD 43  
 COUNTY ROAD 44 TO COLONNADE DEVELOPMENT  
 Dwg. No. T020613-A2-2.7

## 3.2 Natural Environment

A review of the natural environment was completed through online database searches, information requests to agencies and field investigations to confirm existing conditions and address any data gaps. This review was documented in the report entitled “County Road 43 Widening from County Road 44 to Colonnade, Drive, Kemptville Environmental Impact Study” (EIS) dated March 2021 to provide supporting documentation for the EA Addendum and required environmental permit applications for the project. A copy of the EIS is provided in **Appendix I** of this Addendum.

In order to characterize and assess the natural heritage features and functions within the study area, field investigations were undertaken between March 2020 and October 2020. Investigations included the following:

- Butternut tree survey
- Tree inventory
- Wetland delineation
- Aquatic habitat assessment
- Amphibian call surveys
- Breeding bird surveys
- Vegetation community surveys
- Botanical inventories
- Amphibian call surveys
- Turtle surveys

While the aforementioned EIS included the entire project study area referred to as the General Study Area (GSA) as illustrated on **Figure 10**, the primary area of concern is the area that includes the bridge crossing and adjacent lands, referred to as the Focused Study Area (FSA) as illustrated on **Figure 11**. The identified natural heritage features present within the FSA include the Provincially Significant Kemptville Creek Wetland (PSW) and adjacent lands (within 120 metres) as well as fish habitat (including nursery habitat) as identified on Schedule B1 of the Municipality of North Grenville’s Official Plan (2018). The FSA is situated within lands regulated by the Rideau Valley Conservation Authority (RVCA), Parks Canada (PC), the Department of Fisheries and Oceans (DFO), and the Ministry of Natural Resources and Forestry (MNRF).

### 3.2.1 Fish and Fish Habitat

Kemptville Creek is the primary watercourse of the Kemptville Creek subwatershed and the second largest tributary of the Rideau River (RVCA, 2013). It falls within the MNRF Fisheries Management Zone 18 (RVCA, 2013). The subwatershed is formed by the confluence of two forks, the North Branch and the South Branch and includes a drainage area of 456 square kilometers (RVCA, 2013). Kemptville Creek is permanently flowing with a primarily flat gradient and with a back bay and pond. Kemptville Creek exhibits a warm water thermal regime while also supporting many cool water fish species such as Northern Pike, Smallmouth Bass, White Sucker and Yellow Perch (RVCA, 2013). Field studies confirmed suitable habitat conditions to support this function within the FSA and ROW and suitable nursery and productive foraging and refuge within the ROW and FSA on the northwest side of the bridge. MNRF also identified spawning habitat 1 km upstream of the bridge, outside of the ROW. However, the creek within the FSA is likely to function as a migration route and provide fish access to this spawning area. No records of aquatic SAR were returned for Kemptville Creek within or in the vicinity of the GSA or FSA.

AECOM ecologists delineated the wetland boundary for the Kemptville Creek Provincially Significant Wetland (PSW) within the FSA. The wetland had obvious transitions between wetland and terrestrial systems in terms of topography and floral species. The wetland in the FSA is comprised of cattail marsh, swamp thicket, and shallow aquatic areas with floating leaved plants, submergent areas, and open water.

### 3.2.2 Wetlands

Based on the background review, the wetland communities along Kemptville Creek located within the FSA are designated as part of the Kemptville Creek Part 3 PSW. Further, there is an Unevaluated Wetland bordering the Kemptville Creek Part 3 PSW south of the bridge spanning County Road 43.

### 3.2.3 Vegetation

Ecological Land Classification (ELC) surveys were conducted and identified 15 different communities including upland communities such as Cultural Meadow, Cultural Thicket, Cultural Woodland and Deciduous and Coniferous Forest communities. The wetland communities included: Cattail Marsh, Water Lily-Bullhead Lily Floating Leaved Aquatic, Willow Deciduous Swamp, Thicket Swamp and Silky Dogwood Mineral Thicket Swamp. These were separated from the bridge and roadway by an embankment dominated by meadow species and invasive plants. Most communities have been disturbed and contain plant species that are relatively tolerant to disturbance. Weediness indices for most communities ranged between -1 and -3, indicating relatively high invasive weed cover. Based on the community sensitivity indices for individual communities, the most sensitive communities within the FSA included the MAS2-1: Cattail Mineral Shallow Marsh, and the SAF1-1: Water Lily-Bullhead Lily Floating-leaved Shallow Aquatic ecosites.

### 3.2.4 Wildlife and Species at Risk

The majority of amphibian species identified during the three rounds of anuran surveys (April 28th, May 20th and June 3rd, 2020) are considered common within Ontario. However, the western chorus frog, a federal Species at Risk (SAR) and provincial Species of Special Concern (SOCC), was identified calling within the FSA on both the north and south side of the bridge during the field surveys. Based on these observations of western chorus frog, there is SAR habitat under the SARA north of the bridge and Special Concern and Rare Wildlife Species Significant Wildlife Habitat (SWH) south of the bridge.

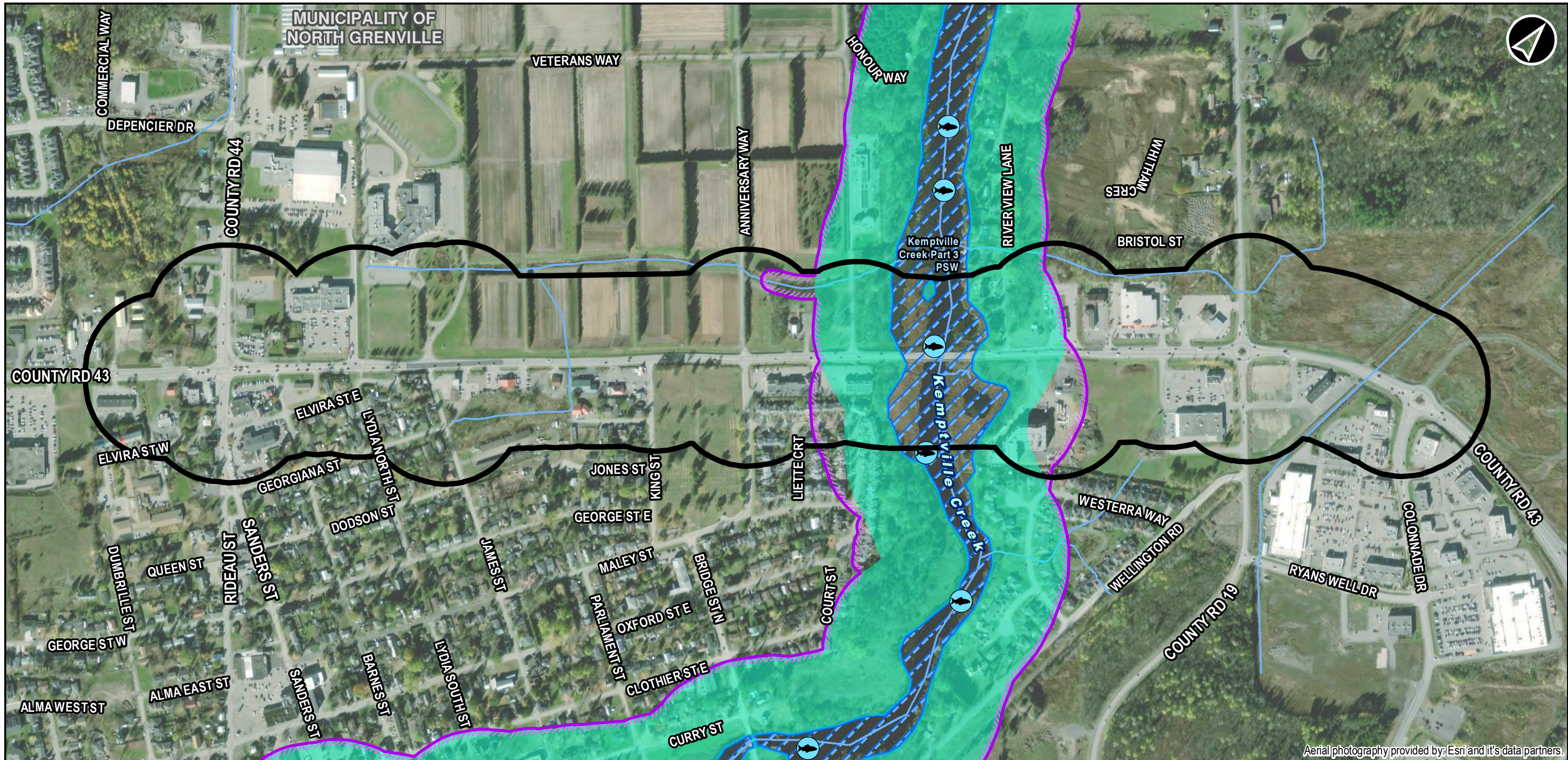
Over the course of the five turtle visual encounter surveys undertaken between May 21st and June 15th, 2020, by AECOM ecologists, no Blanding's Turtles (threatened species in Ontario) were observed in the area of Kemptville Creek, the pond south east of County Road 43, or the back bay north west of County Road 43. Midland painted turtles (no status under ESA) were observed on all dates except June 15th and at all locations on at least one of the dates. Additionally, one snapping turtle was observed travelling upstream through Kemptville Creek. The Snapping turtle is listed as a SOCC for Ontario.

Breeding bird surveys were conducted on June 4th and 23rd, 2020 and incidental observations were recorded between April – June 2020. A total of 30 bird species were recorded during field investigations, including incidental observations. Of these species, breeding evidence was recorded as 'probable' for seven species, 'possible' for 14 species, and 'observed' (i.e., no breeding evidence) for nine species. With the exception of the Chimney Swift, all bird species observed were common. One avian SAR, the Chimney Swift was observed as a flyover during the breeding bird survey.

Background information sources were reviewed and no mammal SAR or SOCC records were identified. Specific records of bat SAR are often not readily available; therefore, species range maps, including MECP range maps and Bat Conservation International were utilized to identify potential bat SAR within the vicinity of the GSA. Based on these range maps, four bat SAR were identified as potentially occurring within the vicinity of the GSA.







Trees within the GSA were assessed for candidate bat habitat according to the MNRF guidelines outlined in the Survey Protocol for Species at Risk Bats within Treed Habitats (MNRF, 2017). Surveys included bat cavity assessments within suitable Ecosites in tandem with the general tree inventory and vegetation community surveys (ELC) on March 11 and June 4, 2020. No suitable cavity trees which would support bat SAR were identified during the general tree inventory or vegetation community survey (ELC).

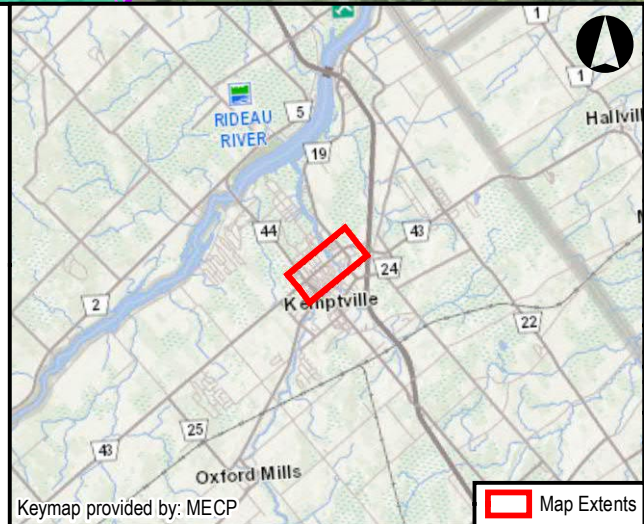
Two muskrats and one red squirrel were also encountered incidentally within the FSA during field investigations on March 11 and June 23, 2020, respectively. These species are considered common and secure within Ontario. The muskrats were observed travelling along the frozen Kemptville Creek southeast of the County Road 43 bridge. No dens or den-building behaviours were observed within the FSA during any of the field investigations.



Aerial photography provided by: Esri and its data partners.

**Legend**

-  General Study Area
-  Regulation Limit (RVCA)
-  Provincially Significant Wetland (PSW) (MECP, 2020)
-  Watercourse (MECP, 2020)
-  Fish Nursery
- Official Plan Schedule B1 - Natural Heritage (Jan 2019)**
-  Provincially Significant Adjacent Lands (120m)

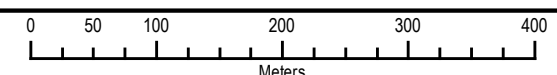


Keymap provided by: MECP

 Map Extents

**County Road 43 Road Widening  
Environmental Impact Study**

**General Study Area**



DATUM: NAD 1983 UTM Zone 17N

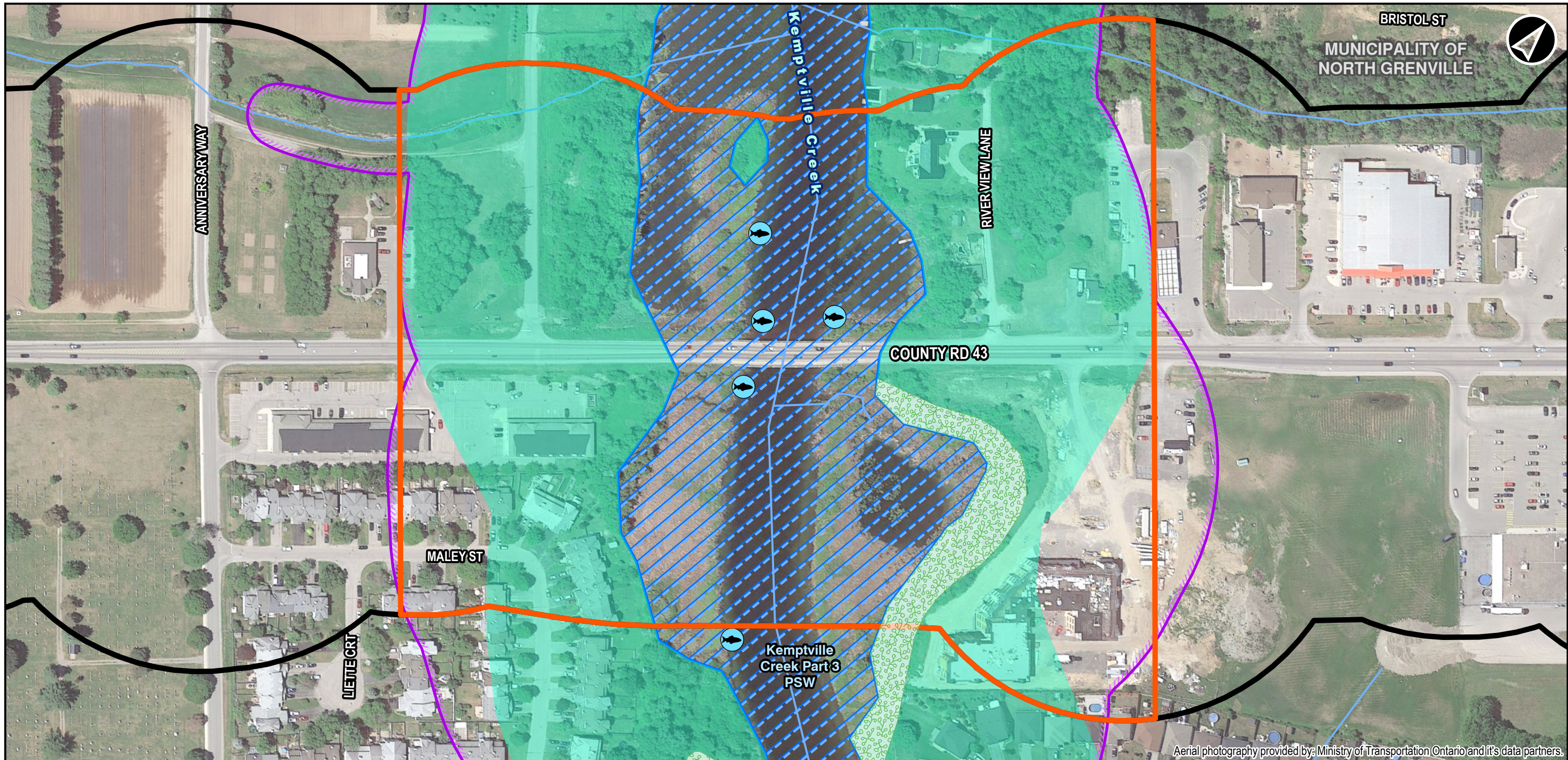
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P#:60526242	Rev:00	



**Figure 10**

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Aerial photography provided by: Ministry of Transportation Ontario and its data partners.

**Legend**

- General Study Area
- Focused Study Area
- Regulation Limit (RVCA)
- Watercourse (MECP, 2020)
- Provincially Significant Wetland (PSW) (MECP, 2020)
- Unevaluated Wetland (MECP, 2020)

**Official Plan Schedule B1 - Natural Heritage (Jan 2019)**

- Provincially Significant Adjacent Lands (120m)
- Fish Nursery



**County Road 43 Road Widening  
Environmental Impact Study**

**Focused Study Area**

0 10 20 40 60 80 100 120 140  
Meters  
DATUM: NAD 1983 UTM Zone 17N

Mar, 2021	1:2,000	<b>Data Sources:</b> MECP, MMAH, Municipality of Grenville
P#:60526242	Rev:00	

**AECOM** **Figure 11**

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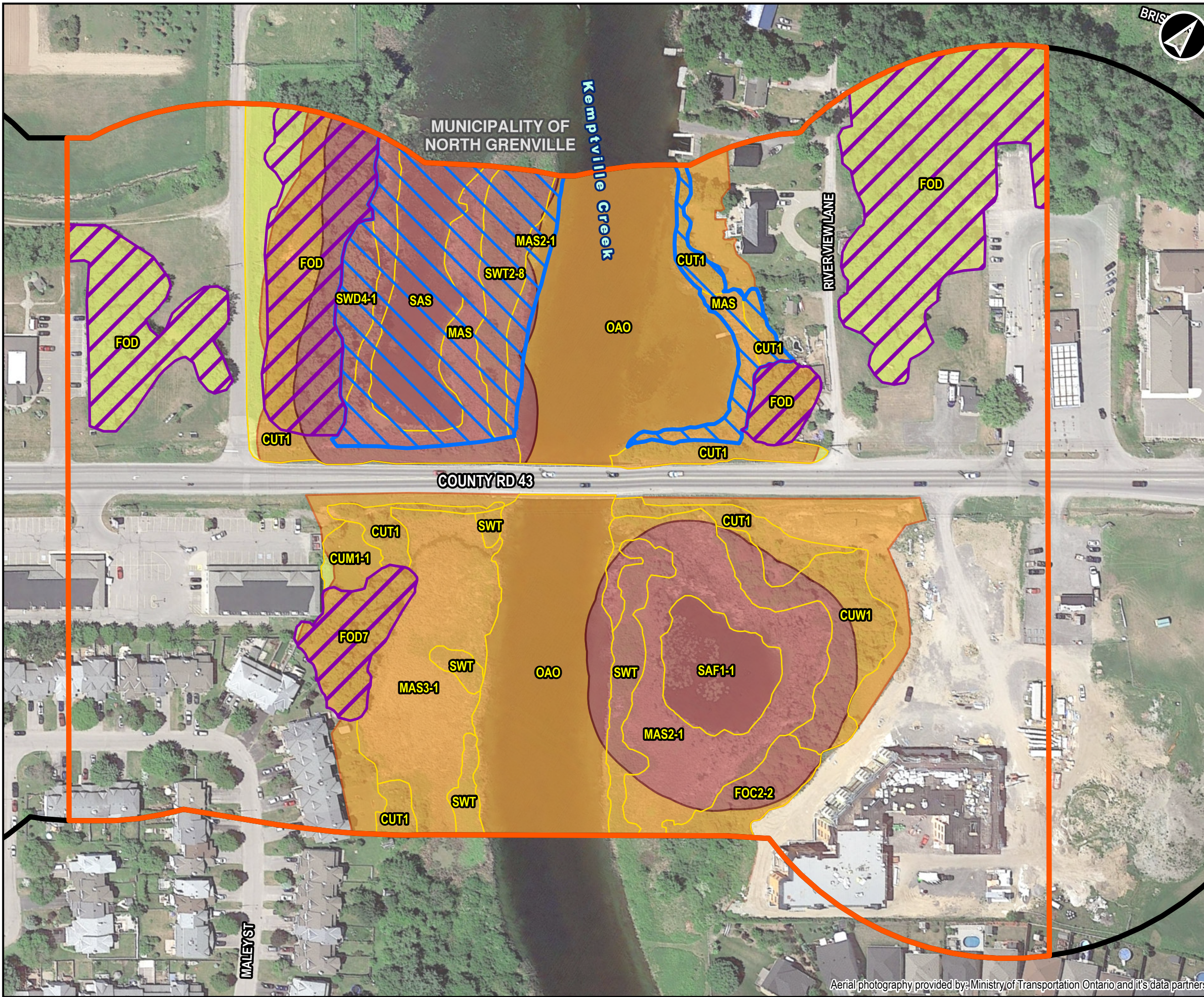
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## Species at Risk

A Species at Risk (SAR) screening exercise was completed to determine the presence and potential impacts to SAR within the study area. The following summarizes the candidate and confirmed provincially designated species and associated habitats with the study area. **Figure 12** delineates the Candidate and Confirmed SAR Habitat and **Figure 13** delineates the Significant Wildlife Habitat.

### **Candidate SAR and SAR Habitat**

- **Bat SAR:** Four bat SAR that included the eastern small-footed myotis, little brown myotis, northern myotis and tri-colored bat were identified as potentially occurring. All of these species are designated as Endangered provincially. Although bat cavity and leaf-cluster assessments for the entire GSA were not completed, trees identified for removal within the FSA during the tree inventory were determined to be unsuitable roosting or maternity habitat (i.e., for tri-colored bat). Candidate habitat remains within the treed communities within the FSA (e.g., FOD) but outside the construction disturbance area.
- **Monarch Butterfly:** This species was identified as potentially occurring within the GSA based on the background review. Limited common milkweed was identified within suitable open communities within the FSA, however no monarch individuals were observed during field investigations and thus the habitat remains candidate. This species is designated as Special Concern provincially and is therefore considered a SOCC. Habitat for this species is considered SWH for Special Concern or Rare Wildlife Species and is afforded protection under the PPS (2020).
- **Blanding's Turtle:** This species was identified as potentially occurring with the GSA based on the background review. No Blanding's turtle individuals were observed during Blanding's turtle visual encounter surveys or incidentally during other field investigations. However, suitable overwintering habitat was identified within the SAF1-1 community and the back bay of Kemptville Creek west of the bridge (SAS community). These communities, along with Kemptville Creek itself, consist of shallow, permanent water that may provide the opportunity for Blanding's turtle to overwinter. No nesting activity was observed during field investigations (e.g., nesting females, predated nests) and suitable nesting habitat was not identified within any natural communities within the FSA. Marginal nesting habitat (i.e., open area, exposed soils) is present where sandy fill has been utilized over a culvert along the road infrastructure which is heavily disturbed and anthropogenically influenced. This marginal nesting habitat is highly likely to experience predation or other impacts (i.e., grading, culvert maintenance). As such, Candidate Blanding's Turtle Category 1 Habitat is present within the FSA and consists of the SAF1-1 and SAS communities along with the surrounding 30 m area (MECP, 2019).
- **Eastern Musk Turtle:** This species was identified as potentially occurring with the GSA based on the background review. No individuals were encountered during visual encounter surveys or incidentally during other field investigations. However, this species is cryptic and can be difficult to detect, thus the habitat remains candidate. This species is designated as Special Concern provincially and is therefore considered a SOCC. Habitat for this species is considered SWH for Special Concern or Rare Wildlife Species and is afforded protection under the PPS (2020).
- **Northern Map Turtle:** This species was identified as potentially occurring within the GSA based on the background review. No individuals were encountered during visual encounter surveys or incidentally during other field investigations. However, suitable riverine overwintering habitat (Kemptville Creek) and marginally suitable nesting habitat (disturbed soils along adjacent development; road embankment) were identified during field investigations. This species is designated as Special Concern provincially and is therefore considered a SOCC. Habitat for this species is considered SWH for Special Concern or Rare Wildlife Species and is afforded protection under the PPS (2020).

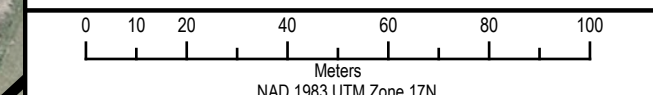


- Legend**
- General Study Area
  - Focused Study Area
  - Vegetation Community
- Species at Risk Habitat**
- Candidate Bat SAR Habitat
  - Confirmed Western Chorus Frog SAR Habitat\*
- Blanding's Turtle Habitat**
- Candidate Category 1 Habitat
  - Confirmed Category 2 Habitat
  - Confirmed Category 3 Habitat

\*Western Chorus Frog is SAR under the Species at Risk act while all other SAR are under the Endangered Species Act.

**County Road 43 Road Widening  
Environmental Impact Study**

**Species at Risk Habitat**

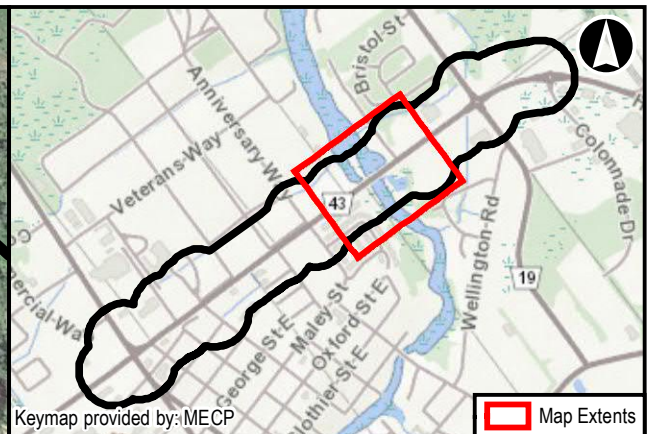


Mar, 2021	1:1,500 <small>* when printed 11"x17"</small>	Data Sources: MECP, MMAH
P#:60526242	Rev:00	

<b>AECOM</b>	<b>Figure 12</b>
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Aerial photography provided by: Ministry of Transportation Ontario and its data partners.



- Legend**
- General Study Area
  - Focused Study Area
  - Vegetation Community
- Significant Wildlife Habitat**
- Candidate Monarch Butterfly Habitat
  - Confirmed Snapping Turtle Habitat
  - Confirmed Western Chorus Frog Habitat
  - Candidate Turtle Wintering
  - Candidate Bat Roosting Habitat

**County Road 43 Road Widening  
Environmental Impact Study**

**Significant Wildlife Habitat**

Meters

DATUM: NAD 1983 UTM Zone 17N

Mar, 2021	1:1,500 <small>* when printed 11"x17"</small>	Data Sources: MECP, MMAH
P#: 60526242	Rev: 00	

**Figure 13**

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Aerial photography provided by: Ministry of Transportation Ontario and its data partners.

Map location: E:\PR\60526242\_CRA\43\Design\01\_Report\GIS\_2020\MXD\_60526242\_SWH\_F00.mxd  
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### Confirmed SAR and SAR Habitat

- **Chimney swift** were observed foraging over Kemptville Creek and adjacent wetland communities within the FSA during site investigations. This species is designated as Threatened provincially. This species and its habitat are therefore afforded protection under the ESA. General habitat, protected under the ESA, includes human-made nests/roosts or natural nests/roost cavities and the area within 90 m of the cavity; no suitable nesting habitat was observed within the FSA and GSA.
- Blanding's turtle
  - Category 2 Habitat was limited to the FSA and encompasses Kemptville Creek, the majority of vegetation communities within the FSA, and extends minimally into the surrounding residential/commercial land-uses. Category 2 habitat within the FSA represents a small portion of the wetland complex within the vicinity of the Blanding's turtle occurrences. Specifically, large contiguous tracts of wetland are present along Kemptville Creek up to the Rideau River that provides Category 2 habitat for Blanding's Turtle.
  - Category 3 Habitat – Based on the Confirmed Blanding's Turtle Category 2 Habitat, the area between 30 m and 250 m around suitable wetlands and waterbodies identified as Category 2 habitat was mapped within the GSA as Confirmed Category 3 Blanding's Turtle Habitat (MECP, 2019). This Category 3 habitat overlaps with three (3) natural communities (FOD; CUM1-1; CUT1) in the FSA and extends into the surrounding residential and commercial land-uses within the GSA. Category 3 habitat within the GSA represents a small portion of Category 3 habitat within the vicinity of the Blanding's turtle occurrences.
- **Snapping turtle:** This species was observed within Kemptville Creek during turtle basking surveys completed in 2020. However, suitable open water overwintering habitat (SAF1-1; back bay of Kemptville Creek) and marginally suitable nesting habitat (exposed soils adjacent to the road and retirement facility) were identified during field investigations. This species is designated as Special Concern provincially and is therefore considered a SOCC. Habitat for this species is considered SWH for Special Concern or Rare Wildlife Species and is afforded protection under the PPS (2020).

### 3.2.5 Significant Natural Heritage Features

Based on the assessment of background information and the findings of field investigations the following significant features and functions are identified within the area of study:

- Kemptville Creek Provincially Significant Wetland
- Kemptville Creek as warmwater fish habitat
- Confirmed Species at Risk (SAR) and SAR Habitat for chimney swift, and Blanding's turtle Category 2 & 3 Habitat
- Confirmed Significant Wildlife Habitat for snapping turtle and western chorus frog

### 3.2.6 Groundwater

The project falls within the Mississippi-Rideau Source Protection Plan and is within the Rideau Valley Source Protection Area. The study area is located within the Kemptville Wellhead Protection Area (WHPA-B), Highly Vulnerable Aquifer area and Significant Groundwater Recharge Area.

The groundwater elevation is expected to be similar to the water level in the Kemptville Creek. As the excavations for the piers are expected to extend below this elevation, significant groundwater infiltration should be expected. A formal dewatering and Permit To Take Water plan is required.

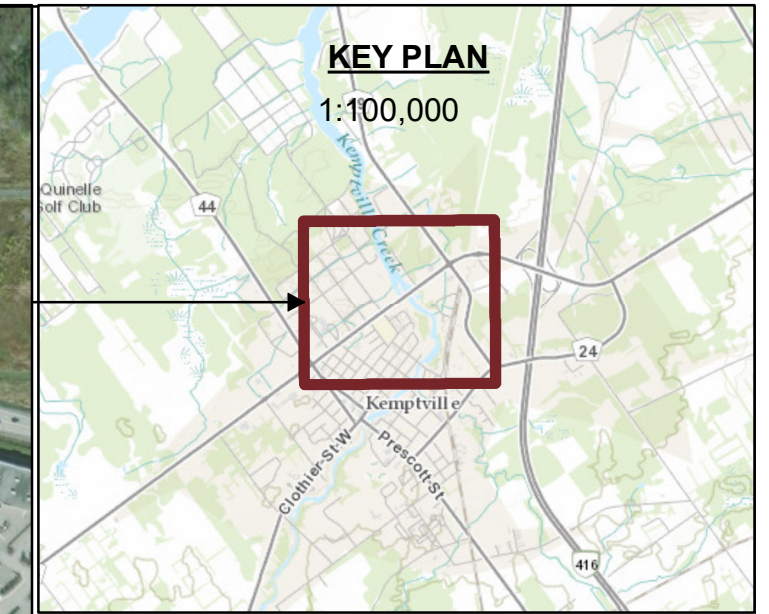
GEMTEC Consulting Engineers and Scientists prepared a Category 3 Permit To Take Water application package for the widening of County Road 43 including replacement of the Kemptville Creek Bridge.

### **3.2.7 Contamination / Waste Management**

A Phase One Environmental Site Assessment (ESA) was completed in 2021 by GEMTEC Consulting Engineers and Scientist Limited along the County Road 43 corridor. A copy of the report is provided in **Appendix J** of this Addendum. Based on the records review and site reconnaissance completed as part of the Phase One ESA investigation, 24 potentially contaminating activities (PCAs) were identified which resulted in nine Areas of Potential Environmental Concern (APEC). Based on a review of records and the site reconnaissance, a Phase Two Environmental Site Assessment (ESA) was recommended to characterize soil and groundwater quality to inform soil management and disposal, dewatering and other aspects related to future construction within the project limits.

A Phase Two Environmental Site Assessment (ESA) was completed in 2021 by GEMTEC Consulting Engineers and Scientist Limited along the County Road 43 corridor. A copy of the report is provided in **Appendix K** of this Addendum. Based on the results of the Phase Two ESA, the soil quality at the project limits does not meet the applicable excess soil quality standards established in the MECP document 'Rules for Soil Management and Excess Soil Quality Standards' dated December 4, 2019. Groundwater quality generally meets the applicable site condition standards established in the MECP document 'Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act'. **Figure 14** provides the location of the boreholes and monitoring wells.

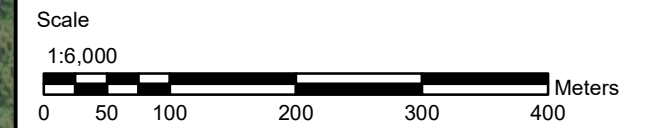
Figure 14: Phase 2 ESA - Borehole and Monitoring Well Location Plan



**Legend**

- Project Limits
- Monitoring Location**
- Borehole
- Monitoring Well
- Borehole (Geotechnical)
- Monitoring Well (Geotechnical)
- Provincially Significant Wetland - Kemptville Creek 3
- Significant Wetland - 30m Buffer
- (XX.XX)** Ground Surface Elevation, in Plan Geodetic (in metres)

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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Client:	<b>AECOM</b>	Project:	63993.74
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Location **County Road 43, Kemptville,  
United Counties of Leeds and Grenville, Ontario**

Drwn By:	Chkd By:	Title:	<b>Borehole and Monitoring Well Location Plan</b>
K.M.	SK.R.		

Date: September 2020	Rev.	<b>Figure: A.1</b>
© Queen's Printer for Ontario	0	

C:\Users\kathryn.maton\Documents\Projects\Aecom CR 43 - Kemptville\Mapping\MXD\Phase Two ESA\Figure A.1 Borehole Location Plan.mxd

### **3.2.8 Surface Water / Drainage**

A hydrological evaluation was undertaken to provide details of the proposed stormwater management design to service the widened County Road 43. The hydrological evaluation focussed on the runoff from the road and external areas and sizing of the stormwater quality treatment. Details are documented in the Stormwater Design Brief report provided in **Appendix L** of this Addendum. The findings are summarized below.

The proposed stormwater management plan will provide water quality treatment for runoff from County Road 43 flows entering Kemptville Creek from both the east and west of the bridge. Water quality control is not required.

CR43 is considered an urban arterial road and according to the 2008 MTO Drainage Manual the minor system level of service is 10 year. Therefore, the basis of the storm sewer design is the 10 year from the North Grenville Design Standards.

There is a major system outlet from the right-of-way along the west side of County Road 43 that discharges north into existing ditches before discharging into Kemptville Creek (downstream of the bridge). Therefore, the storm sewers servicing County Road 43 on the west side of the bridge are sized to capture and convey the 10-year storm event. County Road 43, east of the bridge, does not have any major system outlet, therefore, the storm sewers are sized to capture and convey the 100-year storm event through the storm sewer system to Kemptville Creek.

The runoff from the bridge replacement over Kemptville Creek is designed to sheet flow from the high point mid-bridge to the interface of the bridge and road (i.e., there are no scuppers or internal storm conveyance system servicing bridge drainage). Catchbasins are located on the road at the bridge to capture runoff and convey to the stormwater quality treatment proposed before discharging into Kemptville Creek. There is no intention to direct discharge any runoff from the bridge into Kemptville Creek.

Oil Grit Separators (OGSs) with filtration (OGSF), providing 80% total suspended solids removal, will be used to provide water quality treatment.

The west and east storm sewer outlet tie-in to Kemptville Creek will be at the bottom of the slope, outside the wetland boundary. On the west side, the tie-in is proposed to discharge into a realigned conveyance channel that currently takes storm flows from a development further south of County Road 43 into Kemptville Creek. The location of the west storm outlet will be permanent. For the east storm outlet, the permanent outlet will be adjacent to the south bridge and tie-in to the proposed restoration plan for the creek. Due to construction access needs for bridge, a temporary outlet for the east storm sewer is proposed to discharge flows, by sheet flow, to the south adjacent to the existing pond within the wetland area. This temporary outlet will only be in service until the construction access roads to facilitate bridge works is removed.

## **3.3 Socio-Economic**

Since the filing of the ESR in 2010 there have been some changes to provincial and federal legislation, as described below. This project followed all current legislative requirements in the EA Addendum process and the acquisition of permits and approvals.

### **3.3.1 Land Use and Planning Policy**

The existing land use along County Road 43 has not changed significantly since the 2010 EA. The corridor is mainly commercial and consists of a mix of businesses including retail stores, shopping centres, grocery stores, gas stations, restaurants, cemetery, retirement home, high school and nursery centre.

### Municipality of North Grenville Official Plan

The Municipality of North Grenville Official Plan was updated in 2018 and was adopted by Council on May 14, 2018. The study area for County Road 43 corridor is located in Schedule 'B' Urban Service Area Land Use. The Urban Service Area is where the majority of residential, commercial and business growth and development in the Municipality will take place. Through the identification of an urban service area, there will be less pressure for ad hoc rural development which would subsequently exert pressures on the Municipality's natural heritage systems. By directing the majority of future growth to the Urban Service Area, rural areas will maintain the historical rural character and ensure sustainable growth.

Land use in the study area is primarily designated Highway Commercial with some areas of residential on the south side between County Road 44 and Kemptville Creek and agriculture on the north side between James Street and Kemptville Creek. The land adjacent to Kemptville Creek is designated as Provincially Significant Wetland and Floodplain Hazards. The land use east of County Road 19 is primarily Economic Enterprise (integrated mix of highway commercial, industrial and service commercial uses).

Section 10.9 Special Study Area includes lands abutting County Road 43 from the west side of Highway 416 to Somerville Road and all lands abutting the west side of County Road 44 north of County Road 43 within the Urban Services Areas. Development in this area is subject to the following urban design guidelines:

- Road widening dedication along County Roads;
- Sidewalk dedication;
- Appropriate locations for entrances and exits for safety and turning lanes where appropriate;
- Landscaping provisions;
- Un-intrusive advertising signage;
- Underground placement of utilities;
- Appropriate roadway illumination and traffic control lights.

The growth forecast for the planning period of 2017 to 2031 projects the population to increase from 16,900 to 21,000 persons. The growth numbers are also in keeping with the Counties projections. It is anticipated that the continued economic growth in the National Capital Region will stimulate further net migration to North Grenville, and future housing and local employment growth in the area.

### Planning Act & Provincial Policy Statement

The Planning Act is a provincial legislation that sets out the ground rules for land use planning in Ontario. It describes how land uses may be controlled, and who may control them. Pursuant to the Planning Act, the province of Ontario is the primary planning authority in Ontario.

Under Section 3 of the Planning Act, the Provincial Policy Statement (2020) was issued and provides direction on matters related to land use planning that relate to growth and development, the use and management of resources, the protection of the environment and public health and safety.

### **3.3.2 Amendments to Legislation**

#### Federal Impact Assessment Act, 2019

The Government of Canada launched a comprehensive process to review the environmental assessment laws and regulatory processes. On August 28, 2019, the *Impact Assessment Act* (IA Act) came into force. The new IA Act replaced the *Canadian Environmental Assessment Act* (CEAA), 2012.

The Act is intended to protect the environment, ensure sustainable projects can move forward safely, and instill public confidence in the Government's decision-making process. The following table summarizes the key differences of the Acts.

**Table 1: Summary of Changes to Impact Assessment Act**

CEAA, 2012	Impact Assessment Act, 2019
No early planning and engagement phase	A new mandatory early planning and engagement phase. This means early dialogue with Indigenous peoples, provinces, the public and stakeholders to identify and discuss issues early, leading to better project design.
Three responsible authorities conduct environmental assessments	A single government Agency to lead assessments and coordinate Crown consultations, with Indigenous peoples. Life-cycle regulators work collaboratively with the Agency to provide expertise, as needed.
Availability, accessibility and integration of science and knowledge varies Indigenous knowledge is not consistently considered	Decisions on projects are guided by science, evidence and Indigenous knowledge. An open science and data platform, and plain-language summaries of the facts that support assessments. Mandatory consideration and protection of Indigenous knowledge alongside other sources of evidence in impact assessments. Federal and independent reviews of science.
Legislated timelines	Legislated but flexible timelines maintained for impact assessments and extended to the planning phase.
Environmental assessments focus only on minimizing adverse environmental effects	A move from environmental assessment to impact assessment based on the principle of sustainability. Broaden the scope of assessments to include positive and negative environment, economic, social and health impacts, as well as to require gender-based analysis in order to support holistic and integrated decision-making. An assessment of the impacts of a project on Indigenous peoples and their rights is also required.
Indigenous participation in reviews driven by Duty to Consult	Early and inclusive engagement and participation at every stage, with the aim of securing consent through processes based on recognition of Indigenous rights and interests from the start. Indigenous governments have greater opportunities to exercise powers and duties under the Act.

This project is subject to the IA Act as the County Road 43 bridge design falls within federal lands and includes in-water works. Approvals by federal authorities include Parks Canada, Transport Canada and Department of Fisheries and Oceans. All permits and approvals will be obtained prior to construction.

#### Bill 108: More Homes, More Choice Act, 2019

The Ministry of Municipal Affairs and Housing (MMAH) introduced Bill 108 the "More Homes, More Choice Act" in the Ontario Legislature on May 2, 2019. Bill 108 provides amendments to existing legislation that includes the Environmental Assessment (EA) Act. The amendments to the EA Act are intended to modernize and streamline the EA process in Ontario. Key changes will include a focus on higher risk projects, exemption of very low risk projects from the Class EA process, streamlining of approval times, and the elimination of duplication. The amendments to the EA Act will also result in amendments to the Municipal Class Environmental Assessment (MCEA) process.

The Municipal Engineers Association submitted the proposed amendments to the MCEA document to the Ministry of Environment, Conservation, and Parks (MECP) for review and approval on September 30, 2019 and formal approval is expected in 2021. Given that the amendments have not yet been formally approved, this

undertaking was completed in accordance with the current Municipal Class Environmental Assessment (Oct. 2000, as amended 2007, 2011 & 2015) planning process.

#### Bill 197: COVID-19 Economic Recovery Act, 2020

On July 21, 2020, the Province of Ontario passed the *COVID-19 Economic Recovery Act* (Bill 197), which included amendments to the *Environmental Assessment Act* (EA Act). One of the key amendments associated with Bill 197 is a change in the Part II Order Request process for MCEA projects.

The former appeal process provided the opportunity for any person to submit a Part II Order request to the Ministry of Environment, Conservation and Parks (MECP). In accordance with Bill 197 the Part II Order process is now available only for concerns related to Aboriginal or Treaty Rights. Concerns will no longer be filed with the Ministry but will now be addressed to the proponent. For non-aboriginal concerns the Part II Order process is now replaced with an additional 30-day window for the MECP to decide what action should be taken in response to a concern raised by the general public (i.e. disregard, elevate project (PIIOR granted) or approve with conditions).

The new appeal process still requires the proponent to issue a Notice of Completion and place the EA documentation, in this case the EA Addendum to the ESR, on the public record for a 30-day public review and comment period. However, following completion of the 30-day public review period, the proponent must wait until the additional 30-day window has passed before implementing the project.

The new appeal process was followed in the filing of this Addendum.

### **3.3.3 Traffic**

A traffic analysis was undertaken in 2020 to provide a traffic operations assessment of the proposed design in existing years 2020 and horizon year 2030. The Transportation Preliminary Design Report is included in **Appendix M** of this Addendum.

This study assessed traffic operations for existing and future conditions for the proposed design of County Road 43 from County Road 44 to Colonnade Drive in Kemptville, Ontario. Turning movement counts collected in September 2020 were adjusted by 22% to reflect the reduction in traffic observed during the pandemic. A background growth factor of 2% was applied, based on the population growth forecasted in the municipality of North Grenville.

#### Existing Traffic Volumes

Existing traffic counts were collected at the six key study area intersections. **Figure 15** illustrates traffic volume for existing year 2020.

#### Background Development Traffic Volumes

Traffic volumes generated by the background development was accounted for in this study. The two developments that are expected to be built-out before year 2030 are:

- The Urbandale housing development located on the northwest quadrant of the County Road 43 and County Road 19 intersection; and,
- The Kemptville Gateway Centre (formerly Rosewater) development is located on the northeast quadrant of the County Road 43 and County Road 19 intersection.

Traffic generated by these two developments were obtained from approved traffic studies for these developments and was distributed proportionally to the existing counts at each key intersection across County Road 43. **Figure 16** illustrates traffic volume generated by the background developments.



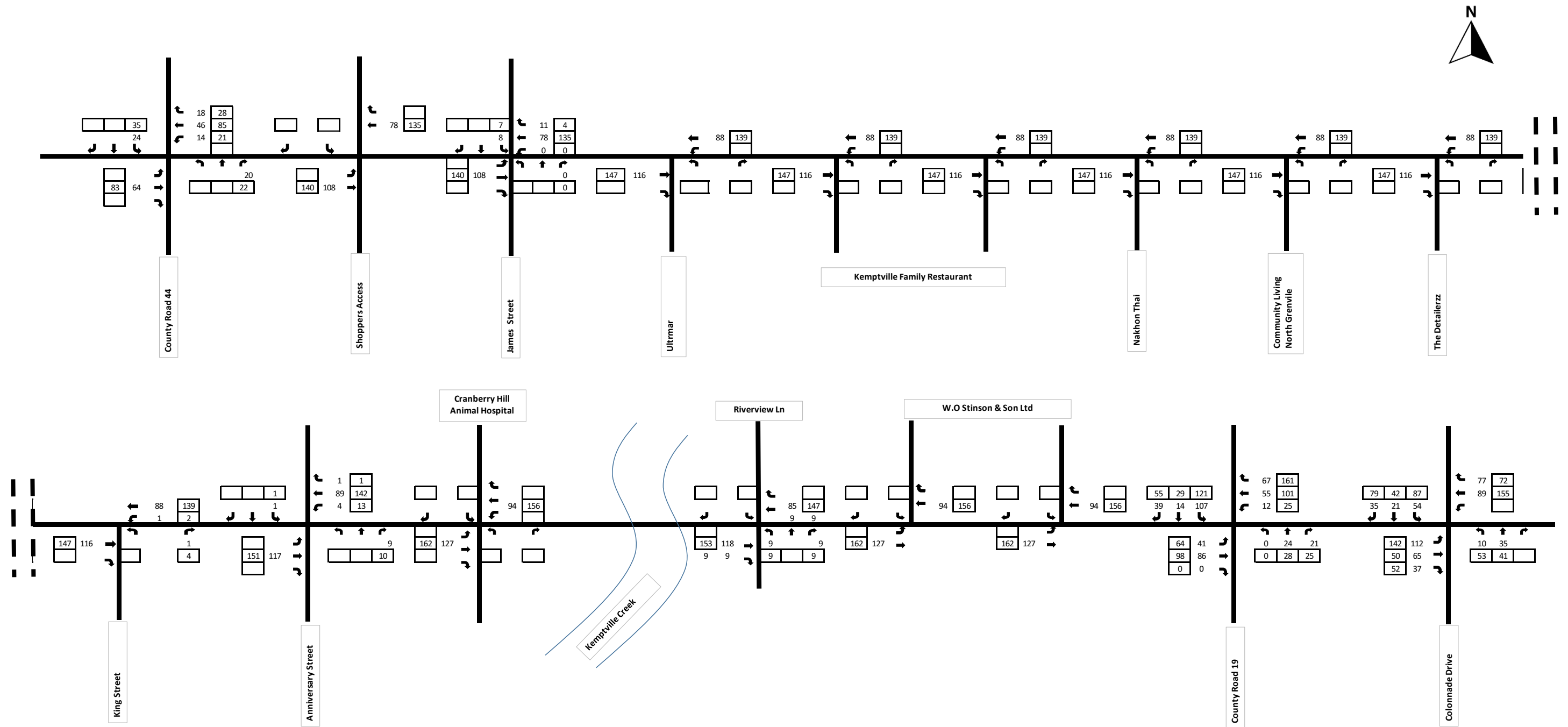


Figure 16: Background Development Traffic Volume

**Legend:**

AM PM

### Future Year 2030 Traffic Volumes

To assess traffic operations for the future year 2030, the adjusted 2020 counts at the six key intersections utilized the compounded growth factors to horizon year 2030. Following this step, the study network traffic volumes were balanced to the highest observed volume in order to account for seasonal and yearly variation in traffic data.

**Figure 17** illustrates traffic volume for future year 2030.

### Intersection Operations

#### **County Road 44**

The intersection of County Road 43 and County Road 44 operates at a high Level of Service (LOS) under existing traffic conditions in both peak hours. Overall, the intersection operates at LOS A in the AM peak hour and at LOS B in the PM peak hour.

Under future traffic conditions, the proposed design operates at a high level of service in the AM peak hour, and in an acceptable level of service in the PM peak hour. The intersection operates at LOS A in the AM peak hour and at LOS C in the PM peak hour, and at a movement level, all movements operate at LOS B or better during the AM peak hour and operates at LOS D or better in the PM peak hour.

#### **Community Square Access (Shoppers Drug Mart Plaza)**

The intersection of County Road 43 and Community Square Access operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A.

Under future traffic conditions, the proposed design operates at a high level of service in the AM and PM peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better.

#### **James Street**

The proposed design at the intersection of County Road 43 and James Street operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better.

Under future traffic conditions, the proposed design operates at a high level of service under in the AM and PM peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS C or better.

#### **King Street**

The proposed design at the intersection of County Road 43 and King Street operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better.

Under future traffic conditions, the proposed design operates at a high level of service under in the AM and PM peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS C or better. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS C or better.

**Anniversary Way**

The proposed design at the intersection of County Road 43 and Anniversary Way operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A.

Under future traffic conditions, the proposed design operates at a high level of service under in the AM and PM peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A.

**Kemptville Retirement Home**

The proposed design at the intersection of County Road 43 and Kemptville Retirement Living Access operates at a high level of service under future traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A.

**Rideau River Road (County Road 19)**

The proposed design at the intersection of County Road 43 and Rideau River Road operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS B or better.

Under future traffic conditions, the proposed design operates at a high level of service under in the AM peak hour and in acceptable condition in the PM peak hour. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS C, at a movement level, all movements operate at LOS C or better, except for the southbound through right movement which operates at LOS D.

**Colonnade Drive**

The proposed design at the intersection of County Road 43 and Colonnade Drive operates at a high level of service under existing traffic conditions in both peak hours. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A.

Under future traffic conditions, the proposed design operates at a high level of service under in the AM peak hour and in acceptable condition in the PM peak hour. In the AM peak hour, the intersection operates overall at LOS A, at a movement level, all movements operate at LOS A. In the PM peak hour, the intersection operates overall at LOS C, at a movement level, all movements operate at LOS C or better.

The fifth lane design in the County Road 43 section between James Street and King Street operates well under existing and future traffic conditions.

**Summary**

In summary, the traffic analysis of the proposed design for the County Road 43 corridor indicates that it will operate well under future traffic conditions and will significantly reduce the queue lengths and improve levels of service for both overall movements, as well as for individual traffic movements.

Pedestrian and cyclists have been accommodated in an extensive bi-directional multi-use pathway system that ties into existing systems on County Road 44, Anniversary Way, County Road 19 and Colonnade Drive. All roadway crossings will be controlled by appropriate pedestrian crossovers (PXO) Level 2: Type C and D.

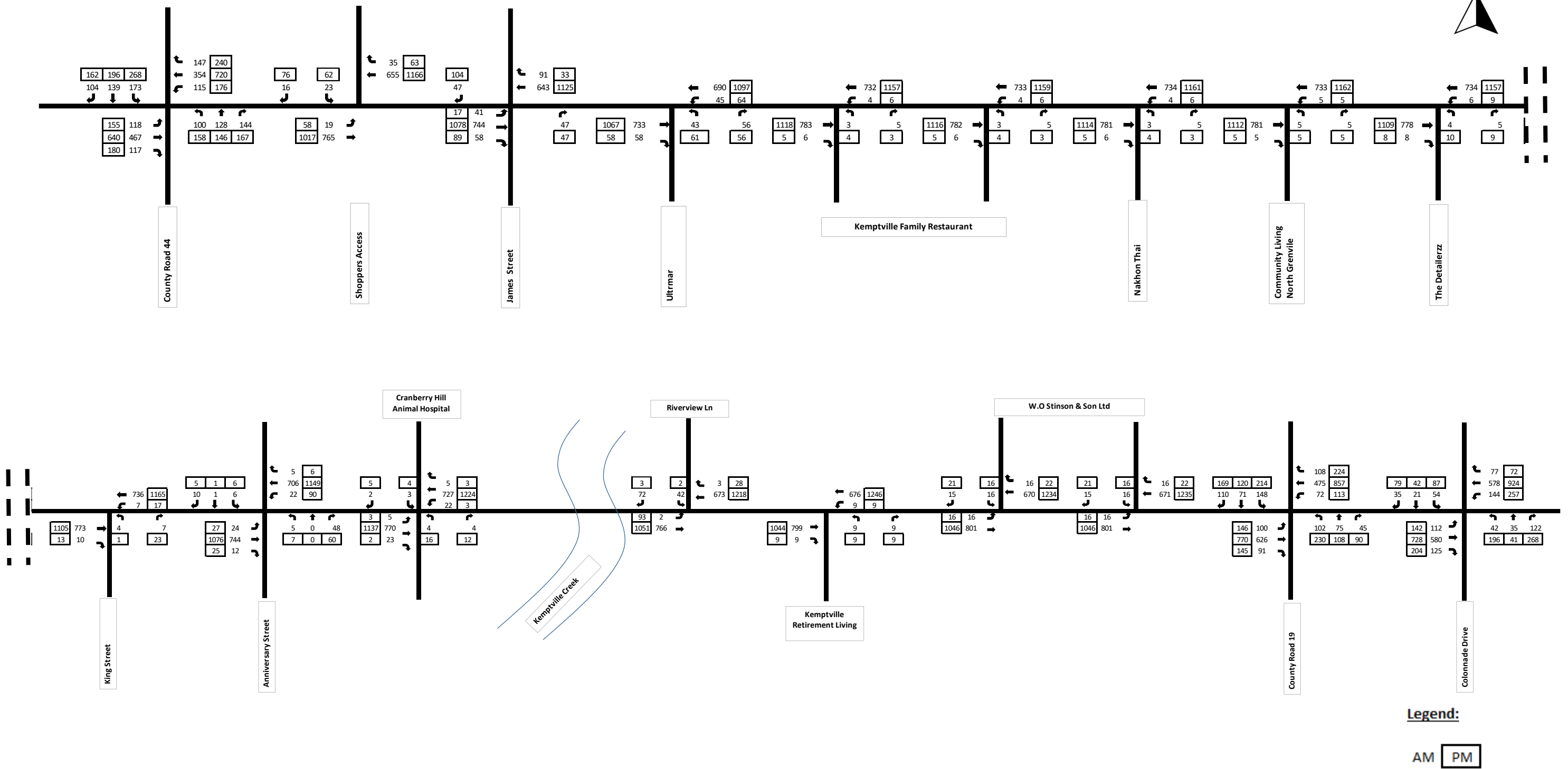


Figure 17: Future Year 2030 Traffic Volume

### 3.3.4 Noise

The County Road 43 Widening Traffic Noise Study that was completed 4 August 2009 by AECOM Canada Ltd, which formed Appendix G of the 2010 Environmental Assessment (EA) concluded: *“In many cases the sound exposures are above the 55 dBA objective limit set by the MTO/MOE guideline with the implementation of the proposed widening. However, since the noise impact at all noise sensitive areas (NSA) is expected to be less than 5dBA, no mitigation effort is required.”*

The following Unmitigated Noise Assessment Results were undertaken as noted in Table D below.

**Table 2: Unmitigated Noise Assessment Results**

**Table D. Unmitigated Noise Assessment Results**

Location	Existing Leq, Day (dBA)	Future Leq, Day (dBA)		Noise Impact (dB)	Preceived Noise Impact
		“Do Nothing”	“With Improvements”		
NSA1	54	56	57	1	Nil
NSA2	55	57	58	1	Nil
NSA3	50	52	53	1	Nil
NSA4	57	59	60	1	Nil
NSA5	52	53	54	1	Nil
NSA6	62	64	65	1	Nil
NSA7	62	64	65	1	Nil
NSA8	63	65	65	0	Nil
NSA9	53	55	56	1	Nil
NSA10	49	51	51	0	Nil
NSA11	49	51	53	2	Nil

A review of the forecasted 2030 traffic volumes undertaken for the updated EA, show that all future traffic volumes are less than what was predicted and utilized in the 2009 Noise Assessment Study analyses.

Also, due to the realignment and reconfiguration of the new roundabouts and roadway cross-section, the location of the centerline of the roadway has had some minor adjustments made, as per the table below, which shows the measurements between new/previous alignments to the noise sensitive areas.

**Table 3: Distance from Centreline to NSA**

Distance from centerline to NSA		
NSA	2010 Alignment	2021 Alignment
5	68.75	70.43
6	28.95	27.89
7	30.12	24.32
8	36.40	38.35
9	55.97	55.92
10	136.62	140.08
11	106.22	106.22

The traffic volumes were calculated for the Forecasted Year of 2030 for both the 2010 EA and the 2021 EA addendum. The following table provides a comparison between the two analyses. The average annual traffic volumes within the various roadway segments illustrate that all 2021 EA Addendum traffic volumes are less than was forecasted for the 2030 timeframe from the 2010 EA.

**Table 4: 2030 Forecasted Traffic Volumes Comparison**

2030 Forecasted Traffic Volumes Comparison		
Roadway Section	2010 EA	2021 EA Addendum
West of CR 44	33000	16375
CR 44 to Anniversary Way	31900	18950
Anniversary Way to CR 19	33000	19110
CR19 to Colonnade Drive	30800	18700

Therefore, the above noted 2010 EA recommendations and conclusions for noise mitigation requirements have not changed in the 2021 EA Addendum.

## 3.4 Cultural Heritage Resources

Cultural heritage resources were assessed as part of the detailed design process to provide an update of existing archaeological and built heritage resources within the area of study.

### 3.4.1 Archaeological Assessment

As part of the 2010 Environmental Study Report a Stage 1 Archaeological Assessment (AA) was undertaken by Archaeoworks Inc. along County Road 43 under Project Information Form P305-004-2009. The Stage 1 AA consisted of a review of geographic, land use and historical information for the property and the relevant surrounding area, a property visit to inspect its current condition and contact with the Ministry of Heritage, Sport, Tourism and Culture Industries to find out whether or not there are any known archaeological sites on or near the property. Its purpose is to identify areas of archaeological potential and further archaeological assessments. The Stage 1 AA recommended that a Stage 2 AA be undertaken for all identified undisturbed locations along County Road 43 and a careful review of the cemetery grounds between King Street and Anniversary Way.

A Stage 2 AA was completed in 2015 by Archaeoworks Inc. for the County Road 43 corridor from County Road 44 to the Colonnade Retail Centre under Project Information Form P029-794-2012. The Stage 2 AA consists of a land survey to identify any archaeological resources and determine whether any archaeological resources found are of sufficient cultural heritage value or interest to require Stage 3 assessment.

The Stage 2 AA recommendations were as follows:

- A total of 18 Euro-Canadian artifacts were recovered during the Stage 2 field assessment. In accordance with Section 2.2, Standard 1.c. of the 2011 S&G, sites that yield fewer than 20 artifacts dating to before ca.1900 do not require further assessment.
- The portion of the Kemptville Public Cemetery lying within the proposed road right-of-way limits no longer represents any archaeological concern.
- A Stage 2 assessment is required for two parcels of land.
- Apart from the two un-assessed parcels, it is recommended that the remainder of the study corridor be considered free from any further archaeological concern.

Construction will not take place until the outstanding Stage 2 archaeological assessments are completed and approvals acquired from the Ministry of Heritage, Sport, Tourism and Culture Industries prior to construction.

### 3.4.2 Built Heritage

A cultural heritage review of the study area was undertaken in 2020 by AECOM cultural heritage specialists. The findings are summarized below.

#### Cultural Heritage Report

The purpose of the cultural heritage review was to provide an inventory of the built heritage resources and cultural heritage landscapes within the study area and assess the impacts of the proposed design. A copy of the Cultural Heritage Report can be found in **Appendix N** of this Addendum.

The preliminary impact assessment of the proposed design recommended that a site-specific Cultural Heritage Evaluation be completed at 2 locations (Kemptville Creek Bridge and Kemptville Cemetery) to determine the cultural heritage value or interest of each property.

#### Cultural Heritage Evaluation of the Kemptville Creek Bridge

The purpose of the cultural heritage evaluation was to determine if the Kemptville Creek Bridge had any cultural heritage value of interest. A copy of the report can be found in **Appendix O** of this Addendum.

The evaluation concluded that the Kemptville Creek Bridge did not have any cultural heritage value of interest. However, since Kemptville Creek is a tributary of the Rideau Canal it is recommended that Parks Canada be consulted to ensure that the national historic features of the Rideau Canal are preserved.

#### Cultural Heritage Evaluation Report: Kemptville Public Cemetery

The purpose of the cultural heritage evaluation was to determine if the Kemptville Public Cemetery had any cultural heritage value of interest. A copy of the report can be found in **Appendix P** of this Addendum.

The evaluation concluded that the Kemptville Public Cemetery met four of the nine criteria of the Ontario Regulation 9/06. Therefore, the subject property does have cultural heritage value or interest and can be considered for municipal designation under Part IV of the Ontario Heritage Act. A Heritage Impact Assessment (HIA) was required to determine the impact of the proposed design on the Kemptville Public Cemetery and provide mitigation measures in order to avoid or minimize any negative impacts to the historic cemetery's cultural heritage value. A copy of the report can be found in **Appendix Q** of this Addendum.

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## 4. Evaluation of Bridge Widening Alternatives

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Given the age of the existing County Road 43 structure built in 1955 and the time lapse between the 2010 EA and 2020 detail design, the bridge design was reviewed.

### Bridge Clearance

The option to increase the bridge clearance was examined in the 2010 EA. It was deemed that the benefits did not offset the impacts associated with the higher clearances, therefore alternatives with clearances greater than the existing 3.35 metres were removed. During the 2020 design review the option to increase the clearance heights was considered but due to the same factors previously identified in the 2010 study, additional cost and greater environmental impacts, the option was not carried forward in 2020.

A summary of key factors identified in the 2010 EA that led to the removal of increasing bridge clearance include:

- South Branch of the Rideau River (Kemptville Creek) is a provincially significant wetland
- Dredging the creek would allow more boats to access the creek, however Parks Canada has advised that dredging would not be permitted as it is a provincially significant wetland
- Larger boats that would benefit from the additional clearances would be restricted by the Bridge Street Bridge only 820 metres further up the creek and would still not be able to access downtown Kemptville
- The higher structures have significantly greater environmental impacts and a greater cost as they require higher and wider approaches that have wetland and property impacts

### Bridge Alternatives

The evaluation of bridge alternatives is detailed in the Preliminary Design Report in **Appendix D** of this Addendum

The following two bridge widening alternatives were considered and evaluated in 2020:

- Alternative 1: Construct a new 2-lane south bridge and rehabilitate the existing 2-lane bridge
- Alternative 2: Construct a new 4-lane bridge and remove the existing 2-lane bridge

Each alternative was evaluated based on selected criteria as outlined in the table below.

**Table 5: Evaluation Criteria**

Evaluation Criteria	Description
<b>Construction Staging and Schedule</b>	Each alternative would be constructed in 2 stages. Two lanes of traffic (one in each direction) will be maintained with occasional short-term single lane closures.
<b>Life Cycle Cost Analysis</b>	Capital cost estimates and life cycle cost analysis (LCCA) have been carried out for both alternatives. The construction costs of future rehabilitations are based on the deck area and the parametric unit price provided by the MTO Parametric Estimating Guide, 2016.
<b>Constructability</b>	Both alternatives will be constructed in staged conditions. Both alternatives will require access roads, cofferdams, excavation, substructure construction, girder erection and deck construction.
<b>Aesthetics</b>	Bridge aesthetics is the visual perception and appearance of the bridge. Appearance is important for prominent structures in the public landscape, especially as bridges are long lifespan structures financed by public funds. Parks Canada has identified aesthetics as a review item.
<b>Environmental</b>	Environmental assessment and permitting requirements and construction impacts. There are several permitting agencies (i.e. Parks Canada, MNRF, DFO, etc.) that will be reviewing the project, and permitting and environmental assessment activities can take several years. It is preferable to obtain all permits at once because all of the work can be completed at one time. Construction impacts to the environment include clearing and grubbing, excavation, cofferdams and dewatering, laydown areas and access road construction.

Each criterion was given an Importance Factor (IF) by comparing the significance of the selected criterion with other criteria. Each alternative was given a score ranging from 1 to 5 for each criterion, 5 indicates the most preferable and 1 indicates the least preferable. The total score is determined for each alternative by summing the product of the importance factor and score of each criterion, i.e. total score = (IF<sub>i</sub> x Score). The alternative with the highest total score will be the most preferred alternative.

**Table 6: Importance Factor**

Evaluation Criteria	Importance Factor (IF)
<b>Construction Staging and Schedule</b>	0.2
<b>Life Cycle Cost Analysis</b>	0.4
<b>Constructability</b>	0.1
<b>Aesthetics</b>	0.1
<b>Environmental</b>	0.2

The results of the evaluation including the evaluation criteria, importance factor and the score assigned are provided in the table below.

**Table 7: Evaluation Results of Bridge Widening Alternatives**

Evaluation Criteria	Evaluation Score	
	Alternative 1: Rehabilitate existing bridge and build new 2-lane bridge	Alternative 2: Remove existing bridge and build new 4-lane bridge
<b>Construction Staging and Schedule</b>	<ul style="list-style-type: none"> <li>• <b>Score: 3</b></li> <li>• Construction is 17-19 months.</li> <li>• Replacement of existing bridge in 25 years. Construction impacts for 14 months.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Score: 4</b></li> <li>• Construction is 26-27 months but will not undergo further major disruptions.</li> </ul>
<b>Life Cycle Cost Analysis</b>	<ul style="list-style-type: none"> <li>• <b>Score: 5</b></li> <li>• Existing north bridge replacement in 25 years and minor rehabilitation in year 50.</li> <li>• New south bridge; minor rehabilitation in 25 years, major rehabilitation in 50 years and replaced in 75 years.</li> <li>• The difference in capital cost estimate and life cycle cost analysis between alternatives is approximately 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Score: 4</b></li> <li>• Minor rehabilitation in 25 years, major rehabilitation in 50 years and replaced in 75 years.</li> </ul>
<b>Constructability</b>	<ul style="list-style-type: none"> <li>• <b>Score: 4</b></li> <li>• Rehabilitation techniques require removal of deteriorated concrete, concrete patching and refacing, and crack injection on vertical and horizontal surface.</li> <li>• Concrete removal quantities on older structures are difficult to accurately predict.</li> <li>• Additional risk for unknown conditions and schedule delays.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Score: 4</b></li> <li>• Removal of existing structure to bedrock at the abutments, to permit new foundation construction.</li> <li>• Additional cofferdams/dewatering for the excavation and construction of new abutments and piers.</li> <li>• Remainder of work has a well-defined scope.</li> </ul>
<b>Aesthetics</b>	<ul style="list-style-type: none"> <li>• <b>Score: 3</b></li> <li>• New 2-lane bridge and a rehabilitated bridge.</li> <li>• The two bridge arrangements will contrast due to the different number of spans and substructure locations.</li> <li>• Rehabilitated bridge will have concrete patch repairs, crack injection, and other contrasting elements between new and original concrete.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Score: 5</b></li> <li>• New 4-lane bridge provides a single type of structure including a clear span of Kemptville Creek.</li> <li>• Utilities will be relocated in between the bridge girders out of view.</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• <b>Score: 3</b></li> <li>• Regulatory permitting and environmental assessment activities in the current project year.</li> <li>• In 25 years, at bridge replacement, permitting and environmental assessment activities will be required.</li> <li>• Construction impacts to the environment in the current project year and again in 25 years.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Score: 5</b></li> <li>• Regulatory permitting and environmental assessment activities in the current project year</li> <li>• Construction impacts to the environment in the current project year.</li> </ul>
<b>Total Score (max. 5)</b>	<b>3.9</b>	<b>4.3</b>

### Preferred Alternative

Based on the results of the site investigation, bridge condition survey, structural evaluation, and alternative evaluation, Alternative 2 is preferred. The recommended bridge design is to construct a new 4-lane bridge and remove the existing 2-lane bridge. Construction will be undertaken in 2 stages. The recommended structure is a 4-lane, 3 span (36-42-36m) concrete deck on prestressed NU girders. The estimated cost for the 4-lane bridge and the removal of the existing north bridge is \$18,000,000.

## 5. Summary of EA Addendum Changes and Updates

The 2010 ESR Recommended Plan included widening County Road 43 to four lanes, rehabilitating the existing 2-lane concrete bridge and constructing a second 2-lane structure to the south of the existing bridge. The changes and updates made to the Recommended Plan since filing of the 2010 ESR are summarized in the table below. The 2021 design is provided in **Appendix A** and 2010 design is in **Appendix B** of this Addendum.

**Table 8: Summary of Changes and Updates to the 2010 ESR Design**

2010 Proposed Corridor Design	2021 Proposed Corridor Design	Rationale for Change
<ul style="list-style-type: none"> <li>• 4-lane urban cross-section</li> <li>• 1.5 metre cycle track</li> <li>• 2 metre sidewalk</li> </ul>	<ul style="list-style-type: none"> <li>• 4-lane urban cross-section</li> <li>• 3 metre multi-use pathway</li> </ul>	<ul style="list-style-type: none"> <li>• The County Road 43 corridor has the majority of residential properties on the south side.</li> <li>• A one-way cycle track would require additional roadway crossings for the majority of recreational users.</li> <li>• The potential high recreational use of the cycling facilities would benefit with a two-way multi-use pathway on both sides of the roadway.</li> </ul>
<ul style="list-style-type: none"> <li>• 5 proposed new roundabouts                             <ul style="list-style-type: none"> <li>• County Road 44</li> <li>• Shoppers Drug Mart</li> <li>• James Street / St. Michael's Catholic High School</li> <li>• Anniversary Way</li> <li>• Riverview Lane</li> <li>• Reconstruction of the County Road 19 roundabout from a two-lane to a four-lane roundabout</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 4 proposed new roundabouts                             <ul style="list-style-type: none"> <li>• County Road 44</li> <li>• Shoppers Drug Mart</li> <li>• Anniversary Way</li> <li>• Stinson / Retirement Home</li> <li>• Reconstruction of two County Road 43 roundabouts at County Road 19 and at Colonnade Drive</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• With the roundabout at the Community Square/Shoppers Drug Mart access in such close proximity to James St and the high school access, it was recommended that this roundabout be removed. Property requirements are also reduced with this access arrangement. The eastbound left turn into the high school remains.</li> <li>• James Street has limited traffic volumes and the majority of the turning movements will be accommodated at the adjacent roundabout.</li> <li>• A roundabout at Riverview Lane would have an impact on the wetlands and the existing embankments are unstable. Full turning movements are accommodated at either of the adjacent roundabouts.</li> </ul>

<ul style="list-style-type: none"> <li>Roundabout at County Road 44</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Add a northbound right turn lane.</li> <li>Add pedestrian switchbacks for pedestrian safety crossing County Roads 43 and 44.</li> </ul>	<ul style="list-style-type: none"> <li>The northbound through movement is a moderate volume, and the northbound right turn cut-off lane was chosen to provide for the northbound right turn in its own lane to restrict the ability for northbound right turning vehicles to manoeuvre into the northbound through lane within the roundabout.</li> <li>Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at Shoppers Drug Mart</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Add pedestrian switchbacks for pedestrian safety crossing County Road 43.</li> </ul>	<ul style="list-style-type: none"> <li>Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at James Street and entrance to St Michaels High School</li> </ul>	<ul style="list-style-type: none"> <li>No proposed roundabout</li> <li>Access for southbound left and westbound left movement are accommodated at the Shoppers roundabout. Westbound left movement from James Street is accommodated at the Anniversary Way roundabout.</li> </ul>	<ul style="list-style-type: none"> <li>The previous 2010 EA provided a roundabout at the High School entrance. As part of this review, an analysis of the turning movements and traffic demands to and from the high school access and James Street was undertaken. With the roundabout at the Community Square/Shoppers Drug Mart access in such close proximity to James St and the high school access, it was recommended that this roundabout be removed. Property requirements are also reduced with this access arrangement. The eastbound left turn into the high school remains.</li> <li>James Street has limited traffic volumes and the majority of the</li> </ul>

		<p>turning movements will be accommodated at the adjacent roundabout. James Street was also realigned slightly to improve intersection geometry.</p>
<ul style="list-style-type: none"> <li>Roadway between James Street and King Street</li> </ul>	<ul style="list-style-type: none"> <li>No centre median between James Street and Anniversary Way.</li> <li>Provide 5th two-way left lane for access.</li> </ul>	<ul style="list-style-type: none"> <li>The roadway cross-section between James Street and King Street allows for full access by implementing a “fifth-lane” design. This fifth-lane design allows for all northbound left turning movements exiting the commercial land uses to be accommodated in a two-stage movement.</li> <li>The traffic operations were evaluated along this corridor with the fifth-lane design. The proposed design will allow for a future raised median to be constructed and controlled left turn lanes implemented if traffic volumes and traffic operational considerations warrant a change to the cross-section in the future once the adjacent land uses are consolidated or redevelopment occurs. This raised median would require land uses to consolidate accesses to provide a number of westbound left turn lanes within the reconstructed center raised median.</li> <li>With the potential of redevelopment of the commercial along the south side in this segment, it is recommended that an operational traffic analyses be undertaken within the five year timeframe to ensure that all traffic movements to and from the commercial land uses can be safely accommodated.</li> </ul>
<ul style="list-style-type: none"> <li>Roundabout at Anniversary Way</li> </ul>	<ul style="list-style-type: none"> <li>Proposed roundabout</li> <li>Entry and exit alignments adjusted.</li> </ul>	<ul style="list-style-type: none"> <li>The north approach to the Kinderwood Trail and Anniversary Park has been designed as a full roadway cross-section to accommodate</li> </ul>

	<ul style="list-style-type: none"> <li>• Add pedestrian switchbacks for pedestrian safety crossing County Road 43.</li> </ul>	<p>users of the municipal facilities. The roundabout geometry has been revised based on current acceptable design standards.</p> <ul style="list-style-type: none"> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at Stinson and Retirement Home</li> </ul>	<ul style="list-style-type: none"> <li>• Shift proposed roundabout at Riverview Lane easterly to the Stinson / Retirement home.</li> <li>• Add a pedestrian switchback for pedestrian safety crossing County Road 43.</li> </ul>	<ul style="list-style-type: none"> <li>• A roundabout at Riverview Lane would have an impact on the wetlands and the existing embankments are unstable.</li> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Rehabilitate existing 2-lane concrete bridge</li> <li>• Construct second 2-lane structure to the south of the existing bridge</li> </ul>	<ul style="list-style-type: none"> <li>• Replace existing 2-lane bridge with new 4-lane bridge extending to the south</li> </ul>	<ul style="list-style-type: none"> <li>• The age of the bridge, site investigations, life cycle costing, bridge condition survey and structural evaluation led to the decision to build a new 4-lane bridge rather than rehabilitate the existing bridge.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at County Road 19 / Rideau River Road</li> </ul>	<ul style="list-style-type: none"> <li>• Widen centre median between Stinson roundabout and County Road 19 roundabout to accommodate potential future left turn lanes.</li> <li>• Add exclusive southbound and northbound left turn lanes.</li> <li>• Add pedestrian switchbacks for pedestrian safety crossing County Roads 43 and 19.</li> </ul>	<ul style="list-style-type: none"> <li>• A full raised center median will be constructed between Kemptville Retirement Living and County Road 19, with all access within this corridor section operating as right-in / right-out movements. Full movements are accommodated at the Kemptville Retirement Living and County Road 19 roundabouts. The center median has been designed to allow for a future left turn opening if and when future developments on the south side warrant and can safely accommodate these movements within this section of the corridor.</li> </ul>

		<ul style="list-style-type: none"> <li>• Pedestrian switchbacks are used as a pedestrian safety measure. They were added to roundabout designs for pedestrians crossing county roads. Switchbacks increase pedestrian safety as they require pedestrians to turn and face oncoming traffic.</li> </ul>
<ul style="list-style-type: none"> <li>• Roundabout at Colonnade Drive</li> </ul>	<ul style="list-style-type: none"> <li>• Modified the geometric design of roundabout to current standards.</li> </ul>	<ul style="list-style-type: none"> <li>• The added northbound and southbound lanes have been added to the roundabout due to the additional traffic demands generated from the new Urbandale residential development on County Road 19 immediately north of the MacEwen’s Gas Bar.</li> </ul>
<ul style="list-style-type: none"> <li>• Property Requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Minor adjustments to property requirements. Minimized the need for some parts of private residential and commercial properties.</li> </ul>	<ul style="list-style-type: none"> <li>• The design changes of the County Road 43 corridor resulted in less property being required at residential and commercial properties.</li> </ul>

## 6. Consultation Process

The project contact list from the 2010 Environmental Study Report was updated where changes could be identified in consultation with stakeholders. The updated contact list is shown in the table below.

The Aboriginal communities, agencies, ministries, municipalities, authorities, and community stakeholders listed were notified of the project at commencement, public consultation and finally to advise them of project completion and the filing of this Addendum. They were encouraged to provide comments and input throughout the project.

The Filing of the Addendum completes the requirements of the Municipal Class EA as it relates specifically to the Addendum process.

**Table 9: Agencies and Groups**

<b>First Nation and Métis Communities</b>
Chiefs of Ontario
Algonquins of Ontario Consultation Office
Mohawk Council of Akwesasne
MNO Ottawa Region Métis Council
Métis Nation of Ontario
<b>Federal</b>
Impact Assessment Agency of Canada
Parks Canada
Transport Canada
Indigenous and Northern Affairs Canada
Environment and Climate Change Canada
Department of Fisheries and Oceans Canada
<b>Provincial</b>
Ministry of the Environment, Conservation and Parks
Ministry of Natural Resources and Forestry
Ministry of Indigenous Affairs
Ministry of Municipal Affairs and Housing, Community Planning and Development
Ministry of Seniors and Accessibility
Ministry of Transportation Eastern Region
Ministry of Heritage, Sport, Tourism and Culture Industries
Ministry of Agriculture, Food and Rural Affairs
Ministry of Children, Community and Social Services - Citizenship and Immigration Division
Rideau Valley Conservation Authority
Ontario Provincial Police
<b>Municipal</b>
Municipality of North Grenville
Village of Merrickville-Wolford
Township of North Dundas
Town of Smiths Falls
Township of Montague
County of Lanark
North Grenville Fire Service

Leeds Grenville Paramedic Service
Leeds, Grenville and Lanark District Health Unit
<b>Community Groups and Associations</b>
Friends of the Rideau
Rideau Waterway Land Trust Foundation
Rideau Environmental Action League
Canadian Recreational Canoe Association
Rideau Roundtable
Community Living North Grenville
Business Network International - Kemptville Chapter
North Grenville Business Builders' Association
North Grenville Heritage Advisory Committee
North Grenville Historical Society
Eastern Ontario Model Forest
Kemptville District Community Association
North Grenville Chamber of Commerce
Ontario Heritage Trust
North Grenville Accessibility Advisory Committee
Old Town Kemptville BIA Board
Ferguson Forest Centre Board
<b>School Boards</b>
Catholic District School Board of Eastern Ontario
Upper Canada District School Board
Conseil des écoles catholiques du Centre-Est de l'Ontario

## 6.1 First Nation and Métis Communities

The Ministry of the Environment, Conservation and Parks was contacted to confirm which Aboriginal communities may be affected by the project and therefore should be contacted. The following Aboriginal communities were identified and contacted as part of the Addendum process:

- Algonquins of Ontario (AOO)
- Mohawks of Akwesasne
- MNO Ottawa Region Métis Council
- Métis Nation of Ontario

At the time of filing of this Addendum report no comments were received from the above First Nation and Métis Communities.

## 6.2 Notice of Commencement

A notice of commencement of Detail Design was placed on the United Counties of Leeds and Grenville web site and in the North Grenville Times newspaper on December 9, 2020 and on December 16, 2020 and sent via email to those on the contact list. The notice explained the need for the addendum to the 2010 Environmental Study Report, advised of the planned public information centre and invited input. A copy of this notice is provided in **Appendix R** of this Addendum.

Comments received at study commencement are summarized in the following table and a copy provided in **Appendix R** of this report with personal information concealed.

**Table 10: Summary of Comments at Study Commencement**

Agency Comments
<b>Ministry of Heritage, Sport, Tourism and Culture Industries</b> <ul style="list-style-type: none"> <li>• Impacts to cultural heritage resources</li> <li>• Consultation with Indigenous communities</li> <li>• Inquired about the remaining Stage 2 archaeological assessments required in the study area</li> <li>• Requested Cultural Heritage Assessment report(s)</li> </ul>
<b>Ministry of the Environment, Conservation and Parks (MECP)</b> <ul style="list-style-type: none"> <li>• Outlined requirements of the Class EA process, MECP technical reviews and Aboriginal consultation</li> </ul>
Public Comments
<ul style="list-style-type: none"> <li>• Requested to be added to the mailing list</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about the height and width of the new bridge</li> </ul>
<ul style="list-style-type: none"> <li>• Request the bridge height clearance be increased to accommodate larger vessels to pass under</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about the extra cost of the new bridge to increase clearance</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about bridge lighting due to the historic nature of the Kemptville Creek</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about loss of property and impacts to property value</li> </ul>
<ul style="list-style-type: none"> <li>• Safety concern of roundabout</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about safety barriers to protect private property</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about increase in noise levels from the widening. Inquired about noise barriers for private property</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about construction impacts: disruption to utility services, damage from noise and vibration levels</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about construction timelines: start date, duration</li> </ul>
<ul style="list-style-type: none"> <li>• Interested in Active Transportation for North Grenville</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about access to businesses: safety, change in location of access, access during construction</li> </ul>
<ul style="list-style-type: none"> <li>• Inquired about design as it relates to ditches</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about roadway grading and stormwater runoff</li> </ul>
<ul style="list-style-type: none"> <li>• Concerned about impacts to traffic during construction: lane closures</li> </ul>

### 6.3 Public Information Centre

Although the Municipal Class EA for the Addendum process does not require public consultation beyond filing the Addendum the Counties felt that due to the time lapse, changes made to the design and public interest on this project that a public consultation event would be beneficial.

A Public Information Centre (PIC) was held on May 19, 2021. Due to the state of COVID-19 and the social distancing measures in place the PIC was undertaken in a Virtual Consultation format via Zoom.

Advertising for the PIC started on May 5, 2021. The notice was placed on both the United Counties of Leeds and Grenville and the Municipality of North Grenville websites. It was published in the North Grenville Times newspaper on May 5, 2021 and on May 12, 2021 and in The Advance newspaper on May 12, 2021. It was also advertised on the Moose radio station and through social media platforms like Twitter and Facebook.

A link to register for the virtual event was provided in the notice and on the Counties website. The display boards were available for viewing prior to the event on the website at the following link:

**[www.leedsgrenville.com/CountyRoad43Widening](http://www.leedsgrenville.com/CountyRoad43Widening)**

A copy of the notice is provided in **Appendix R** of this Addendum.

A total of 76 people registered for the event and 35 people attended the virtual meeting. A copy of the material presented is included in **Appendix R** of this Addendum and consists of the following:

- Introduction and purpose of the Public Information Centre
- Study background and Municipal Class EA process
- Updated existing conditions in the study area (natural environment, cultural and built heritage, traffic and noise)
- 2021 roadway and bridge design and changes made to the 2010 recommended plan
- Municipality of North Grenville coordinated projects on County Road 19 and Colonnade Drive
- Construction schedule
- Next steps and filing of addendum report

Comments received from the public information centre are summarized in the following table and a copy provided in **Appendix R** of this report with personal information concealed.

**Table 11: Summary of Comments from Public Information Centre**

<b>Agency Comments</b>
<b>Ministry of Heritage, Sport, Tourism and Culture Industries</b> <ul style="list-style-type: none"> <li>• Advised on archaeological input into the Addendum</li> <li>• Requested Cultural Heritage Assessment report(s)</li> </ul>
<b>Public Comments</b>
• Concerned about increase in noise levels from the widening. Inquired about noise barriers for private property
• Inquired about construction timelines: start date, duration
• Concerned about access to businesses during construction
• Inquired about landscaping around Cemetery and preservation of the monuments
• Concerned about construction impacts: noise levels, hours of operation, loss of utilities, emergency services
• Inquired about design and impacts to entrances
• Concerned about safety of the left-hand turning lane across two-lanes of traffic at St. Michael High School
• Request the bridge height clearance be increased to accommodate larger vessels to pass under
• Consider inclusion of rest areas i.e. benches and bicycle parking along corridor
• Supportive of planting trees along corridor and in centre medians and landscaping in roundabouts
• Consider planting native species (trees and plants) to reduce invasive and noxious weeds and help create a suitable habitat for pollinators
• Supportive of an accessible, multi-use, bidirectional pathway that is well lit and separated from vehicles on both sides of the road
• Supportive of traffic calming features i.e roundabouts, centre medians, pedestrian switchbacks and activated flashing beacons
• Inquired about road salt treatment. Consider plant species that are tolerant of salt removing nutrients
• Consider roadway lighting that is friendly to insects

## 7. 2021 Recommended Design

The 2021 design is provided in **Appendix A** of this Addendum.

### 7.1 Roadway Design

The roadway design consists of widening of County Road 43 from an existing 2-lane rural cross section with ditches to a 4-lane urban cross section with curbs and storm sewers from just west of County Road 44 to just east of Colonnade Drive in Kemptville. The design criteria for the road is summarized in the table below.

**Table 12: Roadway Design Criteria**

Parameter	Design Criteria
Roadway Classification	Urban Arterial Divided
2030 Forecasted AADT Traffic volumes	West of CR 44 - 16,400 CR44 to Anniversary Way – 18,950 Anniversary to CR 19 – 19,110 CR 19 to Colonnade Drive – 18,700 East of Colonnade Drive – 19,500
Design Speed	60 km/h
Posted Speed	50 km/h
Roadway Cross-Section: <ul style="list-style-type: none"> <li>• # of lanes</li> <li>• Vehicle lane width</li> <li>• Median</li> <li>• Multi-use pathway (MUP) width (both sides)</li> <li>• Boulevard width (both sides)</li> <li>• Distance of MUP from property line</li> <li>• Curb type (at median)</li> <li>• Curb type (at MUP)</li> </ul>	<ul style="list-style-type: none"> <li>• 4</li> <li>• 3.30 metre lanes with 0.2 metre offsets to curb</li> <li>• 4.2 metres</li> <li>• 3.0 metres</li> <li>• 1.50 metres minimum</li> <li>• 0.50 metres minimum</li> <li>• Barrier</li> <li>• Mountable</li> </ul>
Other Features: <ul style="list-style-type: none"> <li>• Lighting roadway, pedestrian, multi-use pathway</li> <li>• Landscaping</li> </ul>	<ul style="list-style-type: none"> <li>• New streetlighting throughout the corridor study area</li> <li>• Pedestrian scale lighting of the MUP's on both sides throughout the corridor study area</li> <li>• Type to be confirmed by both the United Counties of Leeds and Grenville and the Municipality of North Grenville.</li> <li>• Grass medians and boulevards will be included throughout the corridor.</li> <li>• Trees will be planted throughout the corridor to complement adjacent land uses.</li> <li>• Where appropriate, trees will also be planted within wider medians.</li> <li>• Enhanced landscaping will be provided along the Cemetery County Road 43 frontage.</li> </ul>

## 7.2 Kemptville Creek Bridge Design

The recommended structure is a 4-lane, 3 span (36-42-36 m), prestressed concrete NU 1600 girder structure. The structure will be designed in accordance with CHBDC 2019. The structure will have 11 girders and a 225 mm thick cast-in-place reinforced concrete deck. The superstructure will be supported by reinforced concrete piers and semi-integral abutments, founded on spread footings. The wearing surface on the concrete deck will consist of asphalt pavement and waterproofing system (90 mm total). Approach slabs will be constructed at each end with a sleeper slab. Parapet walls will be TL-4.

The new 4-lane bridge deck will have an overall width of 24.05 m and 114 m in length. The cross section of the new bridge deck will consist of four 3.3 m wide lanes, two 3 m wide multi-use-pathways (MUP) (one on each side), a 1.15 m wide raised concrete median, a side clearance of 0.5 m for the lanes along the sidewalk (outside lanes) and 1.0 m for the lanes along the median (inside lanes). A new TL-4 barrier wall will be constructed on both sides.

The new 4-lane bridge will require additional cofferdams/dewatering for the excavation and construction of the new north abutments and piers. The existing 2-lane structure will be removed to bedrock at the abutments, to permit new foundation construction.

The design criteria for the bridge is summarized in the table below.

**Table 13: Bridge Design Criteria**

Parameter	Design Criteria
Roadway Classification	Urban Arterial Divided
2030 Forecasted AADT Traffic volumes	19,110
Design Speed	60 km/h
Posted Speed	50 km/h
Bridge Cross-Section: <ul style="list-style-type: none"> <li>• # of lanes</li> <li>• Vehicle lane width</li> <li>• Centre median</li> <li>• Multi-use pathway (MUP) width (both sides)</li> <li>• Shield clearance from median to inside lane</li> <li>• Shield clearance from outside lane to MUP</li> <li>• Barrier wall (both sides)</li> </ul>	<ul style="list-style-type: none"> <li>• 4</li> <li>• 3.3 metres</li> <li>• 1.15 metres</li> <li>• 3.0 metres</li> <li>• 1.0 metres</li> <li>• 0.5 metres</li> <li>• TL-4</li> </ul>
Other Features: <ul style="list-style-type: none"> <li>• Bridge lighting</li> </ul>	<ul style="list-style-type: none"> <li>• Type to be confirmed by both the United Counties of Leeds and Grenville and the Municipality of North Grenville.</li> </ul>

## 7.3 Construction

The schedule outlined for construction is approximate and based on having obtained all required property, permits and approvals. During construction all accesses will remain open and 2-way traffic will be maintained. However, there could be short periods of time where traffic will be reduced to 1-lane. Lane closures may be required during off-peak periods during the construction of the bridge girders.

**Table 14: Construction Schedule**

Construction Task	Date
Pre-Utility Grading	August 2021
Utility Relocation	August 2021 to November 2021
Tree Removal	October 2021
Tender Process	Late fall 2021 to early winter 2022
Roadway Construction	April 2022 to September 2024
Bridge Construction	July 2022 to September 2024

### 7.3.1 Roadway Construction

The roadway construction will be conducted in two phases. Phase 1 will involve the construction of the north two lanes west of the bridge and the south two lanes east of the bridge, and Phase 2 will involve the construction of the south lanes west of the bridge and the north two lanes east of the bridge. The road widening component of the Project will involve the following tasks:

**Pre-construction:**

- Tree, shrub and non-woody vegetation removal, and
- Installation of erosion and sediment control measures.

**Road Construction:**

- Installation of traffic control measures,

**Phase 1:**

- Construct north half of the road on the west side and construct the south half of the road on the east side,
- Shift traffic on the new north half of the road and update traffic control,

**Phase 2:**

- Construct opposite halves of the new road,
- Complete the construction of roundabouts,
- Installation of street lighting and multi-use pathway, and
- Complete landscaping.

Installation of sanitary sewers, storm sewers, and utilities will be conducted prior to or during road construction.

### 7.3.2 Bridge Construction

Bridge construction will be undertaken in two stages. The schedule accounts for the in-water work restrictions (MNRF: no in-water works are permitted from January 1 to June 30), the vegetation and tree removal restrictions (Migratory Birds Convention Act: no removals permitted from April 1 to August 31 and Bat Active Season from April 1 to September 30) and includes a winter shutdown period from December to April, inclusive.

**Stage 1 – South Half Bridge Construction:**

- Removal of trees and vegetation.
- Install erosion control and wildlife exclusionary fencing.
- Construct access roads and work areas, laydown areas and dewatering areas.
- Relocate Utilities (Bell Canada is the only utility requiring relocation at the bridge).
- Construct south half of new structure to the south of the existing bridge.
- Relocate watermain, forcemains and gasmain underneath new bridge.
- Construct temporary 2-lane road to connect existing road to new bridge.

Stage 1 would consist of constructing the access and laydown areas, installing cofferdams, dewatering systems, constructing the south side of the new 4-lane bridge, it will be constructed to the south of the existing bridge. The

cross-section of the first stage would include 2 driving lanes, the south MUP, the south barrier, and the median. A temporary concrete barrier will be installed on the north side of stage 1. This would have minimal impacts to traffic on CR-43. Some partial closures may be required during girder installation, and temporary protection would be required for substructure excavation and construction.

**Stage 2 – Existing Bridge Removal and North Half Bridge Construction:**

- Removal of trees and vegetation.
- Install erosion control fencing.
- Divert traffic to new south structure.
- Remove existing north structure.
- Construct dewatering areas.
- Construct north half of new structure.
- Shift westbound traffic onto new north half of structure.

Stage 2 would begin with shifting of the existing traffic to the newly built first stage to the south. The existing bridge would then be removed. The new piers, abutments, and superstructures would be constructed. Once complete, the westbound traffic would be shifted to the driving lanes on the north side, and 2 lanes of eastbound traffic would remain on the driving lanes on the south side. Once the bridge work is completed the access roads and laydown areas will be removed and a restoration plan will be undertaken restoring the wetlands and placing any compensation measures.

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## 8. Environmental Effects, Mitigation and Monitoring

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This section summarizes the potential for the works proposed to result in adverse effects and identifies the mitigation recommended to keep these impacts to a minimum. It is recommended that the environmental commitments be incorporated into the detail design and contract documents as appropriate so that contractors are aware of the requirements prior to tendering. Monitoring construction activities must ensure that all environmental standards and commitments for construction are met.

**Table 16** in Section 11 outlines the mitigation measures that have been developed to avoid, mitigate and compensate for impacts to the natural environment.

### 8.1 Technical Environment

#### 8.1.1 Traffic

Traffic management measures and construction staging will be utilized to minimize impacts to local traffic and emergency vehicles. Two lanes of traffic will be maintained at all times, to the extent practical. Access to private properties and businesses will be maintained at all times. If temporary entrance closure is required the Contractor will notify the affected property owners a minimum of 48 hours in advance of the closure and will restore the entrances prior to shutting down at the end of the day.

#### 8.1.2 Utilities and Municipal Services

The reconstruction of County Road 43 and the bridge has the potential to impact both municipal services and utilities during construction. There is both overhead and buried utilities servicing within the project study area that includes Hydro One, Enbridge Gas, Bell Canada and Cogeco. Coordination with utility companies and the Municipality of North Grenville is required. Underground services will be protected during construction.

#### 8.1.3 Geotechnical

##### Temporary Access Roads

Temporary access roadways will be required during the construction of the new bridge. It is anticipated that the access roadways will be used by heavy excavation and haulage equipment, including mobile cranes. The access roadways will be constructed on both the east and west sides of Kemptville Creek and are to be removed after construction. The following is recommended:

- Can be constructed directly on the existing ground surface.
- Sub-excavations of existing soil in some areas may be required to accommodate the proposed pavement structure.
- Recommend raising the roadway surface elevation, where possible, to minimize sub-excavation and groundwater pumping.
- Place the non-woven geotextile at surface grade (or the subgrade surface, where excavation is required) and top with a geogrid. It is not necessary to remove the existing organics or soft/loose soil from below the access roadway. The geotextile and geogrid should be installed to the manufacturer's specifications.
- Place a minimum single, 600-millimetre-thick lift of blast rock on the geogrid/geotextile. It is recommended that this initial lift of blast rock be nominally compacted using the haulage and spreading equipment. The

surface layer of OPSS Granular B Type II should be compacted in maximum 300-millimetre-thick lifts to at least 98 percent of the standard Proctor maximum dry density value.

- Where groundwater inflow is encountered during excavation (where required to accommodate the thickness of the access roadway), pumps installed within the base of the excavation should be used to control groundwater. In the event that groundwater inflow is significant, the geogrid/geotextile and initial lift of blast rock could be placed “in the wet” while controlling groundwater as much as possible using pumps (i.e., the base of the excavation does not necessarily need to be dry; however, an effort should be made to control groundwater as much as possible). As indicated above, it is recommended that the roadway surface elevation be raised, where possible, in order to minimize sub-excavation and groundwater pumping requirements.
- To raise the grade below the access roadway (e.g., adjacent to Kemptville Creek), blast rock could be used to make up the additional depth of grade raise below the surficial 300-millimetre-thick layer of OPSS Granular B Type II.
- Final fill slopes constructed with OPSS Granular B Type II and blast rock should be placed no steeper than 2 horizontal to 1 vertical. The geotextile/geogrid should extend across the full width of the roadway, including the temporary embankment side slopes.
- To support a mobile crane during heavy lifting, construction of a granular working pad will be required.

### Sewer and Watermain Construction

- All excavations should be completed and maintained in accordance with the Occupational Health and Safety Act (OHSA) Regulations for Construction.
- Bedding for buried utilities should be OPSS Granular 'A' or 'B' Type II as applicable, and placed in accordance with pertinent Ontario Provincial Standard Drawings (OPSD).
- Use of clear stone is not recommended for use as bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.
- The cover material should be a sand material or Granular 'A' and the dimensions should comply with pertinent OPSD standards.
- The bedding material and cover materials should be compacted as per OPSS 501 and 514 and to at least 95 percent of its SPMDD.
- Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.
- For service trenches under pavement areas, the backfill should be placed and compacted in uniform thickness compatible with the selected compaction equipment and not thicker than 200 mm. Each lift should be compacted to a minimum of 95 percent SPMDD.
- The backfill placed in the upper 0.5 m below the pavement subgrade elevation should be compacted to a minimum of 100 percent SPMDD.
- To reduce the potential for differential settlement and frost heave, the selected backfill materials should reasonably match the existing soil profile within the frost penetration zone (1.2 m below finished grade). Frost tapers should be used where two dissimilar materials are placed adjacent to each other. Frost tapers should be as per OPSD 800 series which essentially indicates that there should be a backslope of 10:1 (H:V) through the frost zone (i.e., 1.8 m below finished grade in Kemptville area) to the finished grade.
- If the native excavated soils are used as backfill, this material should be protected from moisture increases during construction. The native excavated soils should be assessed and approved by a Geotechnical Engineer prior to placement.
- Excavated soils that are too wet (i.e., greater than 5 percent above the optimum moisture content based upon a Standard Proctor Test) will become problematic to compact and may not perform properly during construction period. If such conditions occur, the options include drying of the soils, compacting and leaving the area untraveled for a period of time, importation of more suitable material, or a combination of above and the use of geotextiles at the base and possibly additional layers within the pavement structure's granular base courses. The appropriate measures will need to be discussed during construction period and be such to achieve adequate performance from the pavement structure.

## 8.2 Natural Environment

The road widening component of this project is not anticipated to result in significant impacts to natural heritage features and functions. This is a consequence of the fact that the road is within an existing urban corridor, and except for the bridge crossing, will not affect any natural features. Potential impacts of the road widening are limited to tree removals within and adjacent to the existing road and road right-of-way. Compensation for loss of trees will be addressed as part of the landscape plans for the road corridor.

The bridge crossing design and construction has numerous implications for impacts to natural heritage features and functions. Some of these are temporary during the construction period and some are permanent as a result of the bridge layout and design. The temporary impacts relate primarily to the construction of an access road and work area that extends into the wetland on the southwest and south east sides. No significant floral or faunal species have been found to be present within the temporary disturbance areas. These areas will be restored and enhanced following construction completion.

Compensation for loss of wetland and aquatic habitat will significantly exceed the losses. The compensation for habitat loss is based on the removal of fill and embankments that support the existing bridge approaches. This removal provides an opportunity for ecological restoration for both wetland and aquatic habitat.

While the Project will have temporary impacts and minor permanent impacts to fish habitat, wetland communities and Significant Wildlife Habitat (SWH), the net effect of the Project will be a net gain in fish habitat, wetland communities, Species at Risk (SAR) and SWH. This net gain will be based on the implementation of an ecological Restoration Plan, as described in the EIS report and illustrated on **Figure 18**.

### 8.2.1 Fish and Fish Habitat

Road construction activities have the potential to generate dust and deposits on adjacent vegetation and run-off including sediment to nearby natural areas or to Kemptville Creek. There is the potential of fuel, grease, oil, or other deleterious substances being released into natural areas close to or into Kemptville Creek. To minimize these impacts the following mitigation measures should be included:

- Implement dust suppression measures to reduce or eliminate dust generation.
- Implement erosion and sediment control measures.
- Implement appropriate spill prevention measures. Develop spill response plan with containment/clean-up materials readily available on site.

Bridge removal and construction activities will involve in-water works including the installation and removal of sheet piling and dewatering wells, the excavation of existing abutments and removal of existing pier, the construction of new pier columns and abutment footings. These works may result in the disturbance of the substrate and potential release of sediment and/or concrete dust and material during cutting/excavation. Access to habitat and entrapment of fish, reptiles and amphibians may be isolated by sheet piling. The following measures should be included to mitigate the impacts:

- Where fine substrate is present, measures such as a turbidity curtain surrounding the in-water installation area of the sheet piling may be required to prevent the release of sediment. Temporary siltation curtains should be maintained until the risk of sediment or turbid water release has diminished.
- In-water work including the installation of temporary access roads and work area isolation measures will adhere to in-water work timing windows (i.e. no work between January 1 and June 30) and will be completed outside of sensitive timing windows for turtles (i.e. overwinter between October and March)
- Fish and wildlife will be removed from the isolated work area during the dewatering process.
- The sheet piling and dewatering of the isolated work area are necessary mitigation measures to avoid significant negative impacts to Kemptville Creek and the Provincially Significant Wetland.

- Excavation will take place within the work area isolated by sheet piling. The pier will be isolated during the cutting and removal (e.g. turbidity curtain).
- Wetland and aquatic habitat restoration and compensation work will stabilize disturbed soils and create habitat in these areas.
- Removal of the existing centre pier by cutting to match the grade of the creek bed. The creek bed substrate will be restored.
- Excavation of existing embankments to match the grade of the wetland with dug pools and connecting channels.
- Measures to prevent building materials deposition within aquatic & wetland habitats.
- Work fencing should be installed to prevent worker access to sensitive natural areas.
- ESC measures should be maintained in place, and re-enforced (as required), until the access roads and work areas have been rehabilitated, stabilized, restored with native vegetation and when vegetation has become established.
- When ESC measures are being removed, removal should be conducted by hand where feasible. Vehicles and other machinery/equipment is not permitted within the wetland restoration areas, or other areas within the wetlands.

### **8.2.2 Wildlife and Species at Risk**

Construction activities have the potential to affect local wildlife and breeding birds. To minimize the impact for noise and disturbance to wildlife and breeding birds during resting periods the following measures should be included in contract documents:

- Restrict construction to between 7am and 7pm. Should work need to occur beyond 7PM, lighting will be shielded downwards to avoid disturbing bat SAR.
- Shrub and non-woody vegetation removal should be avoided between April 1st and August 31st to avoid breeding bird nesting and rearing of young. No SAR or sensitive or rare tree species require removal.
- Avoid suitable cavity tree removal for Bat SAR species. To avoid impacts to Bat SAR, the removal of trees shall be avoided between April 1<sup>st</sup> and September 30<sup>th</sup>.
- Vegetation regrowth in areas within the project work area should be kept at ground-level to prevent bird nesting.

Bridge construction activities have the potential for loss of some wetland and aquatic habitat adjacent to Kemptville Creek. To minimize the impacts on candidate and confirmed Significant Wildlife Habitat and Species at Risk habitat a restoration plan will be included as part of the construction contract for disturbed vegetation and compensation for loss of wetland and upland communities.

The potential impacts of the proposed construction activities on SAR and SAR habitat are minor and of short duration and mitigation measures will be implemented to avoid the killing, harming or harassment of SAR species and the damage or destruction of their habitat. Potential impacts are limited to the following related to SAR and SAR habitat:

- Incidental encounters with potential SAR within the construction disturbance area (e.g., chimney swift foraging, etc.),
- Temporary impacts within the 30 m surrounding the SAF1-1 within Candidate Blanding's Turtle Category 1 Habitat and Confirmed Blanding's Turtle Category 2 Habitat, which will be restored and enhanced through wetland restoration and habitat creation,
- Minimal permanent impacts within disturbed areas along the existing road infrastructure within the 30 m surrounding the Candidate Blanding's Turtle Category 1 Habitat and within Confirmed Blanding's Turtle Category 2 Habitat. Permanent impacts to Confirmed Blanding's Turtle Category 3 habitat is outside of any natural communities that would be utilized as a movement corridor,
- Potential indirect impacts to Candidate Blanding's Turtle Category 1 and Confirmed Blanding's Turtle Category 2 and 3 Habitat, which will be addressed through mitigation measures.

Proposed mitigation measures to minimize impacts on SAR and SAR Habitat include:

**Bat SAR:**

- Construction activities will be limited to the hours of 7AM to 7PM to limit disturbance to wildlife species including bat SAR. Should work need to occur beyond 7PM, lighting will be shielded downwards to avoid disturbing bat SAR.
- Avoid suitable cavity tree removal for Bat SAR species. To avoid impacts to Bat SAR, the removal of trees shall be avoided between April 1<sup>st</sup> and September 30<sup>th</sup>.

**Blanding's Turtle:**

- The construction footprint, specifically the temporary access roads, have been modified to avoid the candidate Blanding's turtle overwintering habitat feature (SAF1-1 community).
- Intrusive construction activities within 30 m of the candidate overwintering habitat (e.g., sheetpiling, abutments, access road work) will be limited to the timing window after turtle nesting season and prior to overwintering (mid-July to late September) to avoid active movement periods and sensitive life stages for Blanding's turtle.
- Exclusion fencing, suitable to prevent turtles from entering the Project footprint, will be implemented around active construction areas in an orientation to direct the turtles away from the Project footprint. Exclusionary fencing will be implemented prior to reptile active season (April 1st) and monitored throughout the active season (April 1 – October 31), in accordance with MECP's Reptile and Amphibian Exclusion Fencing (2020).
- Prior to and following the installation of exclusion fencing, wildlife salvages will be conducted by an ecologist/biologist within the fenced area to relocate any wildlife to suitable habitat outside of the active construction area.
- Further, a Construction Mitigation Plan including a Species at Risk Observation Protocol will be implemented. This protocol will outline the reporting and relocation procedures for any incidental SAR encounters within the Project footprint, including nesting turtles. Any required handling of wildlife will be in accordance with the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (MNR, n.d.).
- Erosion and sediment control (ESC) best management practices will be implemented around watercourses and wetland communities to prevent sedimentation of Blanding's turtle habitat. ESC measures will be monitored and maintained in accordance with Construction Mitigation Plan.
- Fuelling activities will utilize spill containment (e.g., spill trays, secondary containment) and will be limited to areas >30 m from wetland and watercourses.
- Wetland restoration and enhancement, including improved basking opportunities, invasive species management, and native species plantings, will be implemented following construction which may achieve a net overall benefit to Blanding's turtle habitat.

**Chimney Swift:**

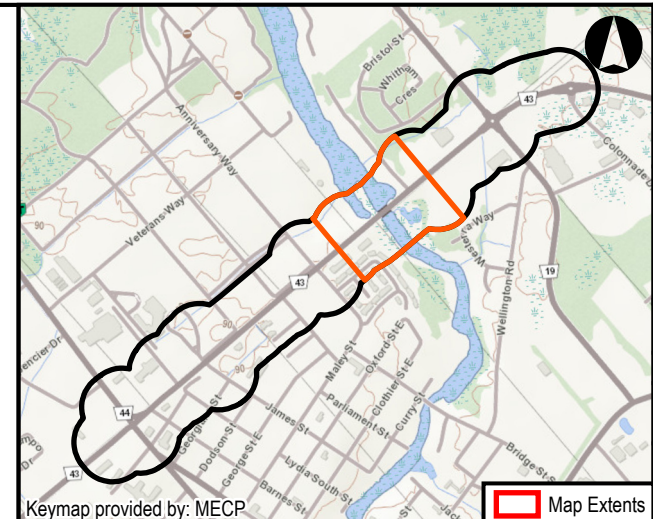
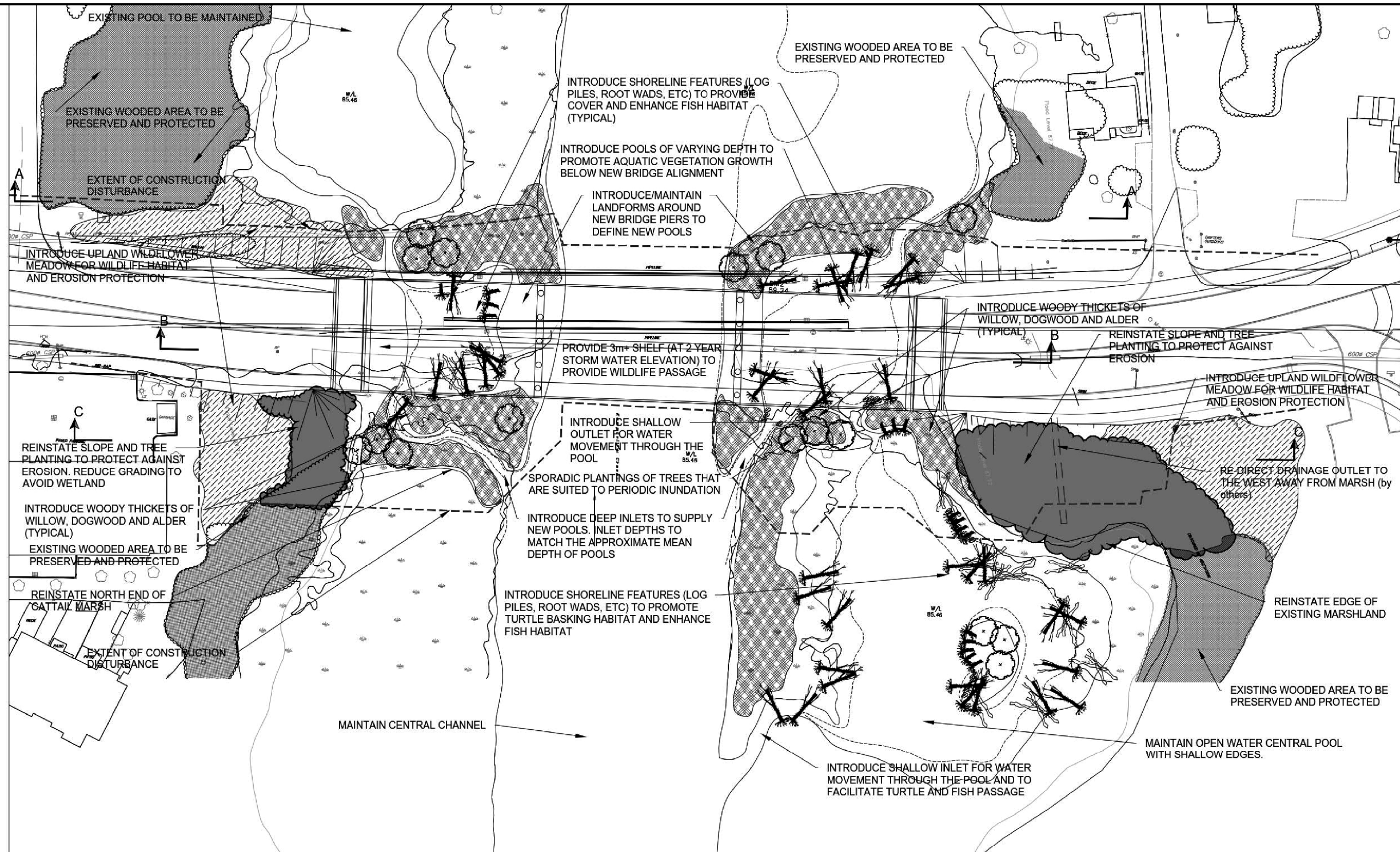
- Construction activities will be limited to the hours of 7AM to 7PM to limit disturbance to wildlife species including chimney swift.
- Should impacts to suitable nesting structures be identified through design alterations, a species-specific nesting habitat assessment will be completed and the need for an authorization will be re-evaluated.

**Bank Swallow:**

- Maintain all stockpiles and exposed soils at a slope less than 70 degrees to render the habitat unsuitable for Bank Swallow nesting as outlined in MNR (2017a).

**Barn Swallow:**

- Recommend the implementation of deterrents and/or exclusionary measures on the bridge prior to April 1st such as flashing lights or solid barriers as outlined in MNR (2017b).



**County Road 43 Road Widening  
Environmental Impact Study**

**Restoration and Enhancement Plan:  
Landscape Design**

Mar, 2021  
P#:60526242

N.T.S.  
Rev:00

Data Sources:



**Figure 18**

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### 8.2.3 Vegetation and Vegetation Communities

Construction activities for the road widening and bridge will involve the removal of some trees, shrubs and vegetation. This has the potential to impact bird species during nesting season. Potential dust generation and deposition on adjacent vegetation. To minimize impacts the following mitigation measures should be followed:

- Shrub and non-woody vegetation removal should be avoided between April 1st and August 31st to avoid breeding bird nesting and rearing of young.
- The removal of trees shall be avoided between April 1<sup>st</sup> and September 30<sup>th</sup>, to avoid impacts to Bat SAR.
- Vegetation regrowth in areas within the project work area should be kept at ground-level to prevent bird nesting.
- Trees to be removed as part of the bridge construction should be replaced at a ratio of 3:1 with native tree species within the study area.
- Newly created road/bridge slopes, lay-down areas and compensation areas provide opportunities for tree and shrub plantings.
- Plantings and vegetation regrowth in areas of temporary disturbance, areas to be restored and areas of compensation.
- Implement dust suppression measures to reduce or eliminate dust generation.

The construction of the road storm sewer and outlet to Kemptville Creek will require the excavation and disturbance of lands adjacent to the Kemptville Creek wetland. There will be a loss of vegetation and potential erosion and disturbance of wetland vegetation. To mitigate these impacts the following measures should be included:

- ESC measures specific to storm sewer works that are to occur outside of the work areas should be installed prior to work.
- Areas of vegetation loss shall be revegetated with native trees, shrubs and groundcover that replicates local native vegetation.

The construction of temporary access roads, work areas and laydown area will require the disturbance and envelopment of vegetation/habitat on the southwest and southeast sides of the wetland for the duration of construction of the bridge. The construction of access roads will result in wetland soil compaction. To minimize these impacts the following measures should be followed:

- Where compaction of soils has occurred, soils will be scarified or cultivated where possible. Addition of organic soil may be required where compacted substrate remediation is not feasible.
- Vegetation will be cut and enveloped with root systems left in place. This will retain soil stability and promote regrowth.
- Areas of vegetation loss shall be revegetated with native trees, shrubs and groundcover that replicates local native vegetation:
- Wetland vegetation/habitat restoration shall include the planting and seeding of vegetation to replicate vegetation loss of communities noted with a net increase in native plant diversity and wetland interspersion.
- ESC measures should be implemented, maintained and monitored for the duration of construction in the area of the proposed access roads and work areas.
- In-water work including the installation of temporary access and work area isolation measures will adhere to in-water work timing windows (i.e. no work between January 1 and June 30) and completed outside of sensitive timing windows for turtles (i.e., overwinter between October and March)

The construction of bridge approaches will result in the loss of cultural habitat on both the east and west sides of Kemptville Creek, as well as a minimal area of forest and wetland communities on both the west side of Kemptville Creek.

- Restoration of disturbed vegetation and compensation for loss of upland communities as part of the project construction contract.

The installation of erosion and sediment control measures (ESC) will have a temporary impact on wetland vegetation along the length of the fencing.

- Installation of ESC measures within wetland areas should be done by hand where feasible.
- ESC fencing should be tied into the sheet piling in a manner to avoid discharge of sediment and other materials from the work area into the wetland.
- ESC measures should be monitored regularly during construction by a qualified inspector.

The removal of access roads and erosion and sediment control measures has the potential to create sedimentation in wetland vegetation communities. Demolition mitigation shall include measures to prevent debris deposition within aquatic and wetland habitats:

- ESC measures should be maintained in place, and re-enforced (as required), until the access roads and work areas have been rehabilitated, stabilized, restored with native vegetation and when vegetation has become established.
- When ESC measures are being removed, removal should be conducted by hand where feasible. Vehicles and other machinery/equipment is not permitted within the wetland restoration areas, or other areas within the wetlands.

#### **8.2.4 Surface Water**

The works proposed will result in an overall improvement to existing drainage. However, there is the potential for negative impact during construction including the release of sediment into Kemptville Creek and the potential spills of fuel, grease, oil, or other deleterious substances to natural areas in proximity to Kemptville Creek, or transport of spilled substances to Kemptville Creek.

The following measures are recommended, where possible, to assist in improving water quality.

- Oil grit separator filtration units are to be installed with the storm sewer network to treat runoff prior to entering Kemptville Creek. Maintenance is recommended annually.
- Silt controls are to be installed and monitored to ensure that exposed soils are not susceptible to erosion following precipitation events.
- Erosion and sediment control measures must be maintained throughout construction and until vegetation is re-established post construction.
- Heavy duty silt fence per OPSD 219.110 around the perimeter of the site with the exception of construction access points and within waterways.
- Rock flow check dams per OPSD 219.210 and 219.211.
- Sediment traps for dewatering (OPSD 219.240) or sediment bags.
- Turbidity curtains within Kemptville Creek (OPSD 219.260 and 219.261).
- Sediment control mud mat at the construction access points.
- Sediment traps with filter cloth to be installed on all existing ditch inlets and catchbasins within the vicinity of the site.
- Erosion blanket if needed for slope protection.
- Sheet piling to isolate the in-water bridge pier works.
- Stockpiled material should be stored a minimum of 30 m from a waterbody with adequate sediment and erosion controls installed.
- OPSS 805 Construction Specification for Temporary Erosion and Sediment Control Measures.
- Implement appropriate spill prevention measures. Develop spill response plan with containment/clean-up materials readily available on site.

The sediment and erosion control plan will be used as a base for the contractor who is responsible for installation, maintenance and monitoring of the measures during construction. The contractor will be responsible to adjust and repair any sediment and erosion control measures as required. The contractor's installation, inspection and maintenance requirements will be captured on the general notes and erosion and sediment control plan.

### Oil Grit Separator Filtration (OGSF) Units

Regular operation and maintenance of the OGSF units are recommended to maintain the unit's maximum water quality performance particularly with respect to the filter cartridges.

Maintenance of the OGSF units is generally recommended to occur annually. A typical maintenance program would include, but is not limited to, checking the depth of the sediment in the unit and sediment removal, if needed; removing hydrocarbons, if present; removing and cleaning filters for reuse. An Owner's Manual outlining the maintenance procedure should be provided with the OGSF units. It is expected that the filter cartridges would have to be replaced every 3 to 5 years, but the frequency is dependent upon regular, annual maintenance and impacted predominately by upstream sediment loading to the unit. Maintenance should also be undertaken on the unit in the event of an upstream spill or leak that reaches the unit.

Specific to the County Road 43 site, the OGSF will be installed with the storm sewer network at the start of the project in the portion of the right-of-way where widening will occur so that the sewers and OGSF can be put into service immediately during construction. Therefore, it is likely that the storm sewers and OGSF will be subject to construction sediment loading for the duration of the County Road 43 widening and bridge construction. An effective, successfully implemented and regularly monitored erosion and sediment measures should help mitigate sediment loading to the storm sewer system and OGSF units.

It is recommended that the contractor be responsible for maintenance and, if determined, replacement of the filter cartridges during the duration of construction to final completion. It is further recommended that before final completion or release of holdbacks, the contractor undertakes a final maintenance inspection and replaces the filter cartridges to provide the County with OGSF units that will begin to perform under normal operation conditions.

### Storm Sewer Outlets

For either the temporary or permanent installation of the storm sewer outlets and tie-in to Kemptville Creek, it is recommended that the outlets and tie-in be included as part of the regular erosion and sediment inspection for the duration of construction as well as the monitoring period following the implementation of the restoration plan. This would allow for any observed concerns related to conveyance or erosion related to the outlets or creek tie-in be addressed in a timely manner.

## **8.2.5 Groundwater**

The hydrogeological investigation indicated that the proposed construction dewatering is not anticipated to cause significant adverse impacts on or off the subject site with respect to neighbouring groundwater users and groundwater quality.

The water supply wells located within 500 metres of the subject site were completed in the bedrock aquifer and given that construction dewatering will be limited to the overburden silty sand or within the top few metres of bedrock and the radius of influence of dewatering is limited to a maximum of 60 metres, no negative impacts are anticipated to potential municipal, communal commercial, public, domestic, and irrigation well users.

The Phase Two Environmental Site Assessment determined that the groundwater quality generally meets the applicable site condition standards established in the MECP document 'Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act'. A location map of the monitoring wells is provided in **Figure 14**. Based on the results, the following is recommended for the project limits:

- Groundwater from MW20-7 should be re-analyzed for VOCs to determine if the 1,3 dichloropropylene concentration exceeds the Table 2 SCS, due to an elevated laboratory detection limit encountered for the sample collected from this location.

- Following completion of field investigations, if the on-site monitoring wells are no longer required, they should be decommissioned in accordance with O.Reg. 903, as amended.

Groundwater from the bridge area will be discharged through filter bags to settling tanks and subsequently to the ground surface in vegetated areas near the bridge area and more than 30 metres away from the surface water bodies. Sedimentation and erosion control measures will be required in order to prevent excessive suspended solids and sediment to enter the wetland and creek. Given the high anticipated flow rates, runoff towards the wetlands and creek is anticipated. The use of straw bales and silt fences to promote settlement and reduce erosion is recommended.

Groundwater pumped in the trench excavations along County Road 43 should preferentially be discharge to storm or sanitary sewers, where available. A discharge agreement will need to be obtained with the Municipality of North Grenville before any groundwater is discharged to sewers. Where no sewer is available, groundwater will be discharged to the adjacent roadside ditches following removal of suspended solids with filter bags and appropriate sediment and erosion control.

Based on the geotechnical investigation (GEMTEC, 2020), the silty clay and clayey silt deposits are susceptible to settlement due to groundwater lowering, since groundwater lowering causes a net increase in effective stress. As such, some settlement of these deposits should be anticipated.

The Contractor will be required to submit for a Category 3 Permit To Take Water (groundwater) and will be required to adhere to all conditions in the Permit To Take Water. Daily records for dewatering should be maintained and made available for inspection by the MECP.

#### Groundwater Level Monitoring:

Daily water taking monitoring is required in order to maintain compliance with the Permit To Take Water. A record of water taking volumes, rates and durations should be maintained for the approved water taking source.

The flow rates for each pump used should be measured by filling a container of known volume with the discharge from the hose and recording the time required to fill the container. Flow rates should be checked periodically and under different pumping conditions (e.g., deep standing water in the excavation vs. 'maintenance pumping' to maintain the water level in an excavation).

The total number of hours spent pumping, the number and types of pumps used for dewatering and the estimated flow rates should be recorded daily and be made available for inspection by the Ministry of the Environment. Furthermore, the contractor is expected to adhere to all other conditions in the Permit To Take Water.

#### Groundwater Quality Monitoring:

Water quality monitoring of turbidity and total suspended solids concentrations should be conducted in the roadside ditches to ensure the discharged water quality meets the total particulate matter outlined in the Canadian Water Quality Guidelines for the protection of aquatic life (Canadian Environmental Quality Guidelines, 2002) before water from the ditches eventually reaches the wetlands or the creek. With such measures in place, impacts to surface water are not anticipated.

### **8.2.6 Contamination/Waste Management**

There is potential for excess materials or debris to be generated during construction. The removal and movement of soil will follow the recommendations as outlined in the Management of Excess Soil – A Guide for Best Management Practices document prepared by the Ministry of Environment, Conservation and Parks.

The Phase Two Environmental Site Assessment determined that the soil quality at the project limits does not meet the applicable excess soil quality standards established in the MECP document 'Rules for Soil Management and Excess Soil Quality Standards' dated December 4, 2019. A location map of the boreholes is provided in **Figure 14**.

Based on the results of the Phase Two ESA, the following is recommended for the project limits:

- It is recommended that the M&I exceedances in soil at BH20-9 be horizontally and vertically delineated east and west of the Kemptville Creek prior to construction activities to determine the quantity of impacted soil and soil re-use options during construction. Soil determined to be impacted should be re-evaluated to determine suitability for re-use at a receiving site with a less sensitive land use, or be disposed of at a MECP approved waste receiving site following confirmation of non-hazardous waste category through completion of a toxicity characterization leachate procedure (TCLP) sample analysis by an accredited analytical laboratory. It is also recommended that a SPLP sample be collected from the vicinity of BH20-9 to determine on-site soil re-use options.
- Soil within the vicinity of BH20-5 from 0.10 to 0.71 m should be re-sampled for OC Pesticides to determine if concentrations are below the applicable Table 2.1 ESQS, due to elevated laboratory detection limits above the Table 2.1 ESQS encountered at this location.
- SPLP analysis for OC Pesticides could be conducted on BH20-6, BH20-7, BH20-8, BH20-12 and BH20-13 within the project limits to confirm and inform soil management and disposal options; however, based on the soil analytical results for OC Pesticides, OC Pesticides are not likely a contaminant of concern within the project limits.
- Soil within the remaining monitoring locations (with the exception of BH20-9 above) may be re-used within the project limits during construction if construction is to commence before January 1, 2022.
- If construction is to commence after January 1, 2022, it is recommended that soil and leachate analysis be conducted on the project limits where excess soil is expected to be generated at the frequency required under Section 8 of O.Reg 406/19.
- Groundwater from MW20-7 should be re-analyzed for VOCs to determine if the 1,3 dichloropropylene concentration exceeds the Table 2 SCS, due to an elevated laboratory detection limit encountered for the sample collected from this location.
- Following completion of field investigations, if the on-site monitoring wells are no longer required, they should be decommissioned in accordance with O.Reg. 903, as amended.

## 8.3 Socio-Economic

The socio-economic environment involves impacts on property acquisition, streetscaping/ landscaping and noise during construction. Streetscaping and landscaping plans are part of detail design and include landscaping and lighting features along the County Road 43 right-of-way, median and boulevards, roundabouts and bridge.

### 8.3.1 Air Quality

Construction activities have the potential to generate dust and fumes which can negatively impact air quality. All impacts will be temporary and limited to the period of construction.

- The Contractor should utilize best management practices during construction to maintain air quality through construction and include no unnecessary idling of vehicles during construction.
- Stockpiles of soil, sand and aggregate should be covered.
- Construction sites and access road shall be regularly cleaned to remove debris and dust caused by construction.
- Dust suppressants shall be applied to control dust generated by construction activities.

### **8.3.2 Land Use and Property Impacts**

The 2021 design has minimized the need for some parts of private residential and commercial properties. Since the 2010 EA some of the property that was identified has been acquired. The remaining area of property that is required to complete the 2021 design is approximately 13,500 m<sup>2</sup>. There is additional property that will be needed temporarily during construction. Where property acquisition is unavoidable, property will be acquired through a willing buyer – willing seller process.

### **8.3.3 Noise**

There is the potential for increased noise during construction; however, this will be temporary and limited to the period of construction. Noise during construction will adhere to the Municipality of North Grenville's Noise By-law. Equipment will be maintained in good operating condition to prevent unnecessary noise. Idling of equipment will be restricted to the minimum necessary to perform the specified work.

## **8.4 Cultural Heritage Resources**

The cultural heritage resources involve impacts on archaeological and built heritage features.

### **8.4.1 Archaeological**

A stage 2 archaeological assessment is required on two parcels of land. Work will be undertaken, and clearance will be obtained from the Ministry of Heritage, Sport, Tourism and Culture Industries prior to construction.

In the event that deeply buried archaeological material is encountered during construction the following steps shall be followed:

- In the event that previously unknown or unassessed deeply buried archaeological resources are uncovered during construction, the contractor shall immediately notify the Contract Administrator. Work shall remain suspended within the subject area until otherwise directed by the Contract Administrator in writing. The CA will contact the United Counties of Leeds and Grenville representative who will confirm the need to engage a licensed consultant archaeologist to carry out any archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.
- In the event that human remains are encountered during construction, the contractor shall immediately notify the Contract Administrator. Work shall remain suspended within the subject area until otherwise directed by the Contract Administrator in writing. The CA will contact the Municipal representative who will notify the police, coroner and the Registrar of the Bereavement Authority of Ontario.

### **8.4.2 Built Heritage and Cultural Heritage Landscapes**

Kemptville Creek is a tributary of the Rideau Canal and consultation with Parks Canada during detail design will ensure that the national historic features of the Rideau Canal are preserved.

Kemptville Public Cemetery is a heritage resource and will require a landscape plan as part of detail design to ensure that the landscaping elements of the cemetery are maintained. Consultation with the Ministry of Heritage, Sport, Tourism and Culture Industries and the Bereavement Authority of Ontario is recommended during detail design. The Heritage Impact Assessment report on the Kemptville Public Cemetery recommended the following:

- Prior to construction a qualified person should undertake a condition assessment of existing landscaping elements.
- Develop a landscape plan with recommendations to be followed at construction.

- Consult with the Ministry of Heritage, Sport, Tourism and Culture Industries, and Michael F. D'Mello, Deputy Registrar, Bereavement Authority of Ontario, as part of the Detailed Design phase prior to release of an RFP, regarding any potential physical impact to the cemetery property, in order to determine approvals or permits required.

## 8.5 Climate Change

The MECP issued a document entitled “Considering Climate Change in the Environmental Assessment Process” (2017) that provides guidance relating to the ministry’s expectations for considering climate change during the environmental assessment process. The Guide is now a part of the Environmental Assessment program's Guides and Codes of Practice. The environmental assessment of proposed undertakings is to consider how a project might impact climate change and how climate change may impact a project.

Climate change concerns relate to the increased concentration of greenhouse gases in the atmosphere which can result in a rise in the global mean surface temperature. Increased temperatures worldwide are creating changes in climate that is resulting in extreme weather events. The rise of greenhouse gas emissions is influencing climate patterns, hydrology, ecosystems and ocean chemistry.

There are two approaches to address climate change. These include reducing a project’s impact on climate change (climate change mitigation) and increasing the local ecosystem’s resilience to climate change (climate change adaptation). However, before a mitigation or adaptation strategy can be established, the potential for the project to impact climate change and the potential impact that climate change may have on a project must be considered. This section of the report will discuss the aforementioned aspects in relation to this project utilizing a qualitative approach.

### 8.5.1 *Potential for Project to Impact Climate Change*

The current undertaking involves the reconstruction of an existing corridor. As it is a transportation project the impacts to climate change relate to vehicular greenhouse gas emissions. The reconstruction will maintain an adequate level of service post construction with minimal delays and it is not expected that the emission of greenhouse gases will significantly increase over existing conditions. The construction of roundabouts compared to traffic signals benefits the environment by reducing the time spent idling resulting in lower emission rates. The construction of the two-way multi-use pathway on both sides of the roadway will make the County Road 43 corridor pedestrian and cyclist friendly which could potentially decrease vehicular use and result in a reduction in vehicular greenhouse gas emissions.

One tool to assist in reducing greenhouse gas levels is through carbon sequestration. Vegetation can assist in removing carbon dioxide from the atmosphere. The County Road 43 corridor is being reconstructed with a new cross-section that maximizes the medians and boulevards for streetscaping including within the roundabouts and therefore allows for the planting of trees throughout the corridor. While it is not a significant amount of vegetation, it is a positive step forward in this regard and will be an improvement over the existing conditions.

### 8.5.2 *Potential for Climate Change to Impact Project*

Climate change has the potential to result in increased storm events that can lead to flooding. The proposed stormwater management plan for this project will improve the overall water quality from the study area. Oil Grit Separator Filtration Units (OGSFU) will be installed with the storm sewer network and will treat the runoff from County Road 43 before entering Kemptville Creek from both the east and west of the bridge. This undertaking is expected to make the area less vulnerable to climate change. The project is not expected to result in a disruption to lands or waters associated with Indigenous cultural resources.

## 8.6 Monitoring

To provide environmental protection and compliance with all applicable regulations specific monitoring requirements should be undertaken which are suitable to the sensitivity of the surrounding environment and scale of the project. Monitoring of environmental impacts and the effectiveness of any mitigation implemented as part of this project should include but not limited to the following:

- Details and locations of the environmental constraints should be identified and specific attention to timing restrictions and reporting requirements.
- Construction drawings detailing the erosion and sediment controls installed should be updated through the construction period.
- Construction staff should undertake Environmental Awareness training to ensure compliance with environmental protection measures.
- Regular inspection of sediment control measures during construction to ensure worker safety and minimal sediment loading.
- High risk areas should be identified on the construction drawings and routinely evaluated. Greater frequency of inspections maybe required for protection measures adjacent to soil stockpiles, protected feature areas, and locations where potential run off may discharge to the water course.
- Regular inspections should occur during all construction stages and should be based on at a minimum the requirements identified in the permits and approvals.
- During inactive construction periods when the site is left alone for 30 days or longer, a monthly inspection should be conducted.
- All damaged erosion and sedimentation control measures should be repaired and/or replaced within 48 hours of the inspection.
- Ecological monitoring of adjacent aquatic, wetland and upland habitat should be undertaken to ensure that there are no construction related impacts to habitats and or to species, including SAR.
- A site inspection should be undertaken following completion of all restoration work to ensure construction has been implemented satisfactorily.
- Post-effectiveness monitoring should be undertaken after the completion of construction to ensure that the objectives of the ecological restoration plan are met.

## 9. Permits and Approvals

This project is subject to permits and approvals including approval under the federal *Impact Assessment Act* (IAA) as the County Road 43 bridge falls within federal lands and includes in-water works. All permits and approvals will be obtained prior to construction.

**Table 15: Permits and Approvals**

Agency	Approval/Permit Type
<ul style="list-style-type: none"> <li>Parks Canada</li> </ul>	<ul style="list-style-type: none"> <li>Approval under the <i>Federal Impact Assessment Act</i></li> <li>In-water works Permit</li> </ul>
<ul style="list-style-type: none"> <li>Transport Canada</li> </ul>	<ul style="list-style-type: none"> <li>Approval under the <i>Canadian Navigable Waters Act</i> administered through the Navigable Protection Program</li> </ul>
<ul style="list-style-type: none"> <li>Department of Fisheries and Oceans (DFO)</li> </ul>	<ul style="list-style-type: none"> <li>Approval under the <i>Fisheries Act</i></li> </ul>
<ul style="list-style-type: none"> <li>Ministry of Environment, Conservation and Parks (MECP)</li> </ul>	<ul style="list-style-type: none"> <li>Approval under the <i>Endangered Species Act</i></li> <li>Environmental Compliance Approval under the Ontario Water Resources Act</li> <li>Permit To Take Water under the <i>Ontario Water Resources Act</i></li> </ul>
<ul style="list-style-type: none"> <li>Ministry of Natural Resources and Forestry (MNRF)</li> </ul>	<ul style="list-style-type: none"> <li>Application to acquire Crown Land</li> </ul>
<ul style="list-style-type: none"> <li>Rideau Valley Conservation Authority (RVCA)</li> </ul>	<ul style="list-style-type: none"> <li>Section 28 Permit under the <i>Conservation Authorities Act</i></li> </ul>
<ul style="list-style-type: none"> <li>Ministry of Heritage, Sport, Tourism and Culture Industries</li> </ul>	<ul style="list-style-type: none"> <li>Approval under the <i>Ontario Heritage Act</i></li> </ul>

### 9.1 Parks Canada

The County Road 43 bridge crosses over Kemptville Creek and is subject to approval under the federal *Impact Assessment Act* (IAA) as the bridge falls within federal lands and includes in-water works.

Parks Canada will act as the designated federal authority under the IAA for this project and will oversee the coordination of federal agencies. Under the federal impact assessment process, a detailed Project Description was submitted to Parks Canada on March 19, 2021 and is under review. Requirements will be met under the federal Impact Assessment process prior to construction.

In addition, as the Kemptville Creek bridge falls within the Rideau Canal and in-water works are required an application to Parks Canada to perform work in the waters and along the shorelines of the Rideau Canal was submitted on March 22, 2021. Approval will be obtained prior to construction.

### 9.2 Transport Canada

An application for approval under the Navigable Protection Program, which administers the *Canadian Navigable Waters Act* (CNWA), was submitted to Transport Canada on April 22, 2021. Approval will be obtained prior to construction.

## 9.3 Department of Fisheries and Oceans

A Request for Review was submitted to the Department of Fisheries and Oceans (DFO) on March 18, 2021 under the requirements of the *Fisheries Act*.

A Letter of Advice (LOA) was received from DFO on May 5, 2021. The LOA provided mitigation measures to be incorporated into the plan to avoid and mitigate the potential for prohibited effects to fish and fish habitat.

## 9.4 Ministry of Environment, Conservation and Parks

### 9.4.1 Species at Risk

Approval from the Ministry of Environment, Conservation and Park (MECP) is required under the *Endangered Species Act*. A submission to MECP was made on March 9, 2021 with a follow-up letter on March 26, 2021.

Correspondence from MECP on April 23, 2021 stated that they reviewed the information submitted on March 9, 2021 and March 26, 2021 to assess the potential impacts of the proposed work on Blanding's Turtle and Species at Risk Bats protected under the *Endangered Species Act, 2007 (ESA)* and have confirmed that neither sections 9 nor 10 of the ESA will be contravened and therefore authorization is not required.

### 9.4.2 Stormwater Management

Environmental Compliance Approval (ECA) is required from the Ministry of Environment, Conservation and Park under the Ontario Water Resources Act for storm sewer pipes and stormwater management measures. An ECA will be submitted for approval prior to construction.

### 9.4.3 Permit To Take Water

A Permit To Take Water (PTTW) will be required from the Ministry of Environment, Conservation and Park under the Ontario Water Resources Act prior to construction. The Contractor will be responsible for obtaining the PTTW.

## 9.5 Ministry of Natural Resources and Forestry

A letter providing the scope of work and plans was submitted to the Ministry of Natural Resources and Forestry (MNRF) on April 9, 2021 for the purpose of determining permit or approval requirements.

A response on May 11, 2021 from MNRF confirmed that since the work on the south side of the bridge falls within the Rideau Valley Conservation Authority administered area, an approval under the MNRF's legislations is not required. However, the United Counties of Leeds and Grenville will need to acquire the parcel of Crown land (bed) under provincial ownership. An application for Crown Land will be completed prior to construction.

## 9.6 Rideau Valley Conservation Authority

Under Section 28 of the *Conservation Authorities Act* and Ontario Regulation 97/04 a permit is required. An "Application for Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses" will be submitted to the Rideau Valley Conservation Authority for approval prior to construction.

## **9.7 Ministry of Heritage, Sport, Tourism and Culture Industries**

Approval is required from the Ministry of Heritage, Sport, Tourism and Culture Industries under the *Ontario Heritage Act*. The Stage 2 Archaeological Assessment reports will be submitted for approval prior to construction.

## 10. Filing of Addendum Report

This Addendum has been prepared in accordance with the requirements of the Municipal Class EA as it relates specifically to the Addendum process. This work included contact with the public and review agencies to ensure that they were aware of the project and that their concerns have been addressed, along with a summary of the updates and/or changes to the project. This represents the conclusion of the planning procedures for the Class EA Addendum process. This section of the report outlines the next steps to be completed prior to the United Counties of Leeds and Grenville proceeding to construction.

A Notice of Filing of Addendum was placed in the North Grenville Times newspaper, on the United Counties of Leeds and Grenville website and sent via email to those on the contact list from the 2010 Environmental Study Report. The contact list has been updated where changes can be identified in consultation with stakeholders.

The addendum is being placed on the United Counties of Leeds and Grenville web site at the following link:  
[www.leedsgrenville.com/CountyRoad43Widening](http://www.leedsgrenville.com/CountyRoad43Widening)

### 10.1 Review Period of this Addendum

The review period of this addendum is 30 calendar days. Comments and concerns should be sent by mail or e-mail to:

<p><b>Arup Mukherjee, P.Eng.</b>  <b>Project Manager for the</b>  <b>United Counties of Leeds and Grenville</b>            ARKim Solutions Inc.            C: 613-802-9735            Email: arup@arkim.ca</p>	<p><b>Michael Flainek, M.Eng., P.Eng.</b>  <b>Project Manager</b>            AECOM Canada Ltd.            302-1150 Morrison Drive            Ottawa, Ontario K2H 8S9            Tel: (613) 797-6862            Email: michael.flainek@aecom.com</p>
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Accessibility is important. If you are a person with a disability and need information in another format, please contact Arup Mukherjee or Michael Flainek at the above addresses.

### 10.2 Process for Requesting an Order for a Higher Level of Study

A request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study (that is, requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (such as requiring further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests should include the requester's contact information and full name for the ministry.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statements made in the request. This will help ensure that the ministry is able to efficiently begin reviewing the request.

The request should be sent in writing or by email to both addresses below:

<b>Minister of the Environment, Conservation and Parks</b> <b>Ministry of Environment, Conservation and Parks</b> 777 Bay Street, 5th Floor Toronto ON M7A 2J3 Email: minister.mecp@ontario.ca	<b>Director, Environmental Assessment Branch</b> <b>Ministry of Environment, Conservation and Parks</b> 135 St. Clair Ave. W, 1st Floor Toronto ON, M4V 1P5 Email: EABDirector@ontario.ca
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A copy of the request should also be sent to Arup Mukherjee at the United Counties of Leeds and Grenville (contact information provided above).

Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.

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# 11. Summary of Environmental Concerns, Mitigating Measures and Commitments

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The proposed mitigation measures and commitments to future work to address specific concerns associated with the proposed undertaking are summarized in **Table 16** for quick and easy reference.

**Table 16: Summary of Environmental Effects, Mitigation and Commitments to Future Work**

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
1.	<p><b>Traffic</b></p> <ul style="list-style-type: none"> <li>• Construction activities have the potential to impede traffic.</li> <li>• Emergency vehicle access to businesses and institutions.</li> <li>• Access to businesses and institutions.</li> </ul>	<ul style="list-style-type: none"> <li>• Two lanes of traffic will be maintained at all times, to the extent practical.</li> <li>• Construction shall utilize traffic management measures (i.e. construction staging, detours etc.) to minimize impacts to local traffic and to maintain access during construction.</li> <li>• The contractor will be required to maintain access during construction to all entrances. If a temporary entrance closure is needed, the contractor will be required to provide notification to affected property owners, in writing, 48 hours in advance of the closure. The contractor shall also be required to restore all entrances prior to shutting down at the end of the day.</li> </ul>
2.	<p><b>Utilities and Municipal Services</b></p> <ul style="list-style-type: none"> <li>• The reconstruction of County Road 43 and the bridge has the potential to impact both municipal services and utilities during construction.</li> <li>• There is both overhead and buried utilities servicing within the project study area that includes Hydro One, Enbridge Gas, Bell Canada and Cogeco.</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinate with utility companies for relocation of services. This work should be completed prior to construction.</li> <li>• Coordinate with Municipality of North Grenville for the underground sanitary sewers, forcemains and watermains.</li> <li>• Ensure services are maintained during construction.</li> <li>• Protect underground services during construction.</li> </ul>
3.	<p><b>Geotechnical</b></p> <ul style="list-style-type: none"> <li>• Construction of temporary access roadways are required for bridge construction to accommodate heavy machinery.</li> <li>• Construction of roadway will require heavy machinery.</li> </ul>	<p>To minimize impacts the following is recommended: <u>Temporary Access Roads:</u></p> <ul style="list-style-type: none"> <li>• Can be constructed directly on the existing ground surface.</li> <li>• Sub-excavations of existing soil in some areas may be required to accommodate the proposed access road structure.</li> <li>• Recommend raising the roadway surface elevation, where possible, to minimize sub-excavation and groundwater pumping.</li> <li>• Place the non-woven geotextile at surface grade (or the subgrade surface, where excavation is required) and top with a geogrid. It is not necessary to remove the existing organics or soft/loose soil from below the access roadway. The geotextile and geogrid should be installed to the manufacture's specifications.</li> <li>• Place a minimum single, 600-millimetre-thick lift of blast rock on the geogrid/geotextile. It is recommended that this initial lift of blast rock be nominally compacted using the haulage and spreading equipment. The surface layer of OPSS Granular B Type II should be compacted in maximum 300-millimetre-thick lifts to at least 98 percent of the standard Proctor maximum dry density value.</li> <li>• Where groundwater inflow is encountered during excavation (where required to accommodate the thickness of the access roadway), pumps</li> </ul>

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
		<p>installed within the base of the excavation should be used to control groundwater. In the event that groundwater inflow is significant, the geogrid/geotextile and initial lift of blast rock could be placed “in the wet” while controlling groundwater as much as possible using pumps (i.e., the base of the excavation does not necessarily need to be dry; however, an effort should be made to control groundwater as much as possible). As indicated above, it is recommended that the roadway surface elevation be raised, where possible, in order to minimize sub-excavation and groundwater pumping requirements.</p> <ul style="list-style-type: none"> <li>• To raise the grade below the access roadway (e.g., adjacent to Kemptville Creek), blast rock could be used to make up the additional depth of grade raise below the surficial 300-millimetre-thick layer of OPSS Granular B Type II.</li> <li>• Final fill slopes constructed with OPSS Granular B Type II and blast rock should be placed no steeper than 2 horizontal to 1 vertical. The geotextile/geogrid should extend across the full width of the roadway, including the temporary embankment side slopes.</li> <li>• To support a mobile crane during heavy lifting, construction of a granular working pad will be required.</li> <li>• All excavations should be completed and maintained in accordance with the Occupational Health and Safety Act (OHSA) Regulations for Construction.</li> </ul> <p><u>Roadway Construction:</u></p> <ul style="list-style-type: none"> <li>• Bedding for buried utilities should be OPSS Granular 'A' or 'B' Type II as applicable and placed in accordance with pertinent Ontario Provincial Standard Drawings (OPSD).</li> <li>• Use of clear stone is not recommended for use as bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.</li> <li>• The cover material should be a sand material or Granular 'A' and the dimensions should comply with pertinent OPSD standards.</li> <li>• The bedding material and cover materials should be compacted as per OPSS 501 and 514 and to at least 95 percent of its SPMDD.</li> <li>• Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.</li> <li>• For service trenches under pavement areas, the backfill should be placed and compacted in uniform thickness compatible with the selected compaction equipment and not thicker than 200 mm. Each lift should be compacted to a minimum of 95 percent SPMDD.</li> </ul>

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
		<ul style="list-style-type: none"> <li>• The backfill placed in the upper 0.5 m below the pavement subgrade elevation should be compacted to a minimum of 100 percent SPMDD.</li> <li>• To reduce the potential for differential settlement and frost heave, the selected backfill materials should reasonably match the existing soil profile within the frost penetration zone (1.2 m below finished grade). Frost tapers should be used where two dissimilar materials are placed adjacent to each other. Frost tapers should be as per OPSD 800 series which essentially indicates that there should be a backslope of 10:1 (H:V) through the frost zone (i.e., 1.8 m below finished grade in Kemptville area) to the finished grade.</li> <li>• If the native excavated soils are used as backfill, this material should be protected from moisture increases during construction. The native excavated soils should be assessed and approved by a Geotechnical Engineer prior to placement.</li> <li>• Excavated soils that are too wet (i.e., greater than 5 percent above the optimum moisture content based upon a Standard Proctor Test) will become problematic to compact and may not perform properly during construction period. If such conditions occur, the options include drying of the soils, compacting and leaving the area untraveled for a period of time, importation of more suitable material, or a combination of above and the use of geotextiles at the base and possibly additional layers within the pavement structure's granular base courses. The appropriate measures will need to be discussed during construction period and be such to achieve adequate performance from the pavement structure.</li> </ul>
4.	<p><b>Fish &amp; Fish Habitat</b></p> <ul style="list-style-type: none"> <li>• The bridge construction will require in-water work in Kemptville Creek.</li> <li>• Installation of sheet piling in open water sections of Kemptville Creek surrounding the abutments has potential for temporary disturbance of the substrate and potential temporary release of sediment.</li> <li>• Potential for restricted access and entrapment of fish, reptiles and amphibians to habitat within the area isolated by sheet piling.</li> <li>• Potential dust generation and deposition on adjacent vegetation or in Kemptville Creek.</li> <li>• Potential of fuel, grease, oil, or other deleterious substances being released into natural areas close to or into Kemptville Creek.</li> </ul>	<p>To minimize the potential for impacts to fish and fish habitat the following standard construction measures should be implemented during construction:</p> <ul style="list-style-type: none"> <li>• In-water work including the installation of temporary access roads and work area isolation measures will adhere to in-water work timing windows (i.e. no work between January 1 and June 30) and will be completed outside of sensitive timing windows for turtles (i.e, overwinter between October and March)</li> <li>• Where fine substrate is present, measures such as a turbidity curtain surrounding the in-water installation area of the sheet piling may be required to prevent the release of sediment.</li> <li>• Fish and wildlife will be removed from the isolated work area during the dewatering process.</li> <li>• The sheet piling and dewatering of the isolated work area are necessary mitigation measures to avoid significant negative impacts to Kemptville Creek and the wetlands.</li> </ul>

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
		<ul style="list-style-type: none"> <li>• Silt controls should be installed and monitored to ensure that exposed soils are not susceptible to erosion following precipitation events.</li> <li>• Erosion and sediment control measures must be maintained throughout construction and until vegetation is re-established post construction.</li> <li>• Stockpiled material should be stored a minimum of 30 m from a waterbody with adequate sediment and erosion controls installed.</li> <li>• OPSS 805 – Construction Specification for Temporary Erosion and Sediment Control Measures</li> <li>• Implement dust suppression measures to reduce or eliminate dust generation.</li> <li>• Implement appropriate spill prevention measures. Develop spill response plan with containment/clean-up materials readily available on site.</li> </ul>
5.	<p><b>Wildlife and Species at Risk</b></p> <ul style="list-style-type: none"> <li>• Potential noise impacts to nearby natural areas in areas proximate to Kemptville Creek</li> <li>• Potential for bird nesting activity on the existing bridge and within the proposed bridge work area.</li> <li>• Potential for entrapped wildlife during installation and wildlife impingement causing injury or mortality during use may be limited, however, precautions should be taken.</li> <li>• Species at Risk that have the potential to be in the area include the four Endangered Bat Species (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis and Tri-colored bat), Blanding’s Turtle (Threatened), Chimney Swift (Threatened), Bank Swallow (Threatened) and Barn Swallow (Threatened).</li> </ul>	<p>The following mitigation measures will assist in the protection of area wildlife and SAR during construction:</p> <ul style="list-style-type: none"> <li>• The Contractor shall avoid destroying nests of migratory birds. To avoid impacts to birds (including SAR birds), the removal of vegetation (including clearing and grubbing) shall be avoided between April 1st and August 31st.</li> <li>• The Contractor shall avoid suitable cavity tree removal for Bat SAR species. To avoid impacts to Bat SAR, the removal of trees shall be avoided between April 1<sup>st</sup> and September 30th.</li> <li>• Vegetation regrowth in areas within the project work area should be kept at ground-level to prevent bird nesting.</li> <li>• Restrict construction to between 7am and 7pm to reduce disturbance to wildlife species including SAR and breeding birds during resting periods for most species identified in the study area. Should work need to occur beyond 7PM, lighting will be shielded downwards to avoid disturbing bat SAR.</li> <li>• Intrusive construction activities within 30 m of the candidate overwintering habitat (e.g., sheetpiling, abutments, access road work) will be limited to the timing window after turtle nesting season and prior to overwintering (mid-July to late September) to avoid active movement periods and sensitive life stages for Blanding’s turtle.</li> <li>• Wildlife Exclusion Fencing (WEF) should be installed following recommendations outlined in Best Management Practices for Mitigating the Effects of Roads on Amphibians and Reptiles Species at Risk in Ontario (MNR, 2016) and constructed for target species known within the study area (i.e., Blanding’s turtle).</li> </ul>

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
		<ul style="list-style-type: none"> <li>• Exclusionary fencing will be implemented prior to reptile active season (April 1st) and monitored throughout the active season (April 1 – October 31), in accordance with MECF's Reptile and Amphibian Exclusion Fencing (2020).</li> <li>• Installation of Erosion and Sediment Control (ESC) measures within wetland areas should be done by hand where feasible.</li> <li>• ESC fencing should be tied into the sheet piling in a manner to avoid discharge of sediment and other materials from the work area into the wetland.</li> <li>• A pre-clearance survey should be completed by a qualified ecologist/biologist prior to WEF installation to remove any wildlife from the area of construction.</li> <li>• WEF and ESC measures should be monitored regularly during construction by qualified inspector.</li> <li>• Fuelling activities will utilize spill containment (e.g., spill trays, secondary containment) and will be limited to areas &gt;30 m from wetland and watercourses.</li> <li>• Where fine substrate is present, measures such as a turbidity curtain surrounding the in-water installation area of the sheet piling may be required to prevent the release of sediment.</li> <li>• In-water work including the installation of temporary access roads will be completed outside of sensitive timing windows for turtles (i.e, overwinter between October and March)</li> <li>• The sheet piling and dewatering of the isolated work area are necessary mitigation measures to avoid significant negative impacts to Kemptville Creek and the provincially significant wetland. Fish and wildlife will be removed from the isolated work area during the dewatering process.</li> <li>• The contractor shall make certain that personnel working on the site are aware of potential Species at Risk (SAR) that could be encountered (i.e. the four Endangered Bat Species (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis and Tri-colored bat), Blanding's Turtle (Threatened), Chimney Swift (Threatened), Bank Swallow (Threatened) and Barn Swallow (Threatened)) and that the species are protected by law. Individuals working on site shall ensure that SAR are not harmed during construction or killed by heavy machinery, vehicles, or other equipment.</li> <li>• Further, a Construction Mitigation Plan including a Species at Risk Observation Protocol will be implemented. This protocol will outline the reporting and relocation procedures for any incidental SAR encounters within the Project footprint, including nesting turtles. Any required</li> </ul>

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		<p>handling of wildlife will be in accordance with the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (MNR, n.d.).</p> <ul style="list-style-type: none"> <li>• Maintain all stockpiles and exposed soils at a slope less than 70 degrees to render the habitat unsuitable for Bank Swallow nesting as outlined in MNR (2017a).</li> <li>• Recommend the implementation of deterrents and/or exclusionary measures on the bridge prior to April 1st such as flashing lights or solid barriers as outlined in MNR (2017b).</li> <li>• If a SAR is encountered during construction, all works in the immediate area must cease and the Contract Administrator and the SAR Biologist at the Ministry of Environment, Conservation and Parks, Kemptville District office should be contacted immediately. Harassment to SAR should not occur during construction activities.</li> </ul>
6.	<p><b>Vegetation and Vegetation Communities</b></p> <ul style="list-style-type: none"> <li>• Trees and shrubs along the road widening portion of the project are limited in numbers and are common, non-native or horticultural varieties. No natural heritage features will be affected.</li> <li>• Potential dust generation and deposition on adjacent vegetation.</li> <li>• Excavation and disturbance of lands adjacent to Kemptville Creek from construction of road storm sewer and outlet, temporary access roads and work areas and bridge approaches.</li> <li>• Installation of ESC measures will have a temporary impact on wetland vegetation along the length of the fencing.</li> </ul>	<p>To minimize the potential for impacts the following standard construction measures should be implemented during construction:</p> <ul style="list-style-type: none"> <li>• The Contractor shall avoid the removal of vegetation (including clearing and grubbing) between April 1st and August 31st to avoid breeding bird nesting and rearing of young.</li> <li>• The Contractor shall avoid tree removal between April 1st and September 30th to avoid impacts to Bat SAR.</li> <li>• Vegetation regrowth in areas within the project work area should be kept at ground-level to prevent bird nesting.</li> <li>• Trees to be removed should be replaced at a ratio of 3:1 with native tree species within the study area.</li> <li>• Newly created road/bridge slopes, lay-down areas and compensation areas provide opportunities for tree and shrub plantings.</li> <li>• Plantings and vegetation regrowth in areas of temporary disturbance, areas to be restored and areas of compensation.</li> <li>• Implement dust suppression measures to reduce or eliminate dust generation.</li> <li>• ESC measures specific to storm sewer works that are to occur outside of the work areas should be installed prior to work.</li> <li>• Areas of vegetation loss shall be revegetated with native trees, shrubs and groundcover that replicates local native vegetation.</li> </ul>

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		<ul style="list-style-type: none"> <li>• Where compaction of soils has occurred, soils will be scarified or cultivated where possible. Addition of organic soil may be required where compacted substrate remediation is not feasible.</li> <li>• Vegetation will be cut and enveloped with root systems left in place. This will retain soil stability and promote regrowth.</li> <li>• Areas of vegetation loss shall be revegetated with native trees, shrubs and groundcover that replicates local native vegetation:</li> <li>• Wetland vegetation/habitat restoration shall include the planting and seeding of vegetation to replicate vegetation loss of communities noted with a net increase in native plant diversity and wetland interspersion. Refer to ecological Restoration Plan (Figure 18).</li> <li>• ESC measures should be implemented, maintained and monitored for the duration of construction in the area of the proposed access roads and work areas.</li> <li>• In-water work including the installation of temporary access and work area isolation measures will adhere to in-water work timing windows (i.e. no work between January 1 and June 30) and completed outside of sensitive timing windows for turtles (i.e., overwinter between October and March)</li> <li>• Restoration of disturbed vegetation and compensation for loss of upland communities as part of the project construction contract. Refer to ecological Restoration Plan (Figure 18).</li> <li>• Installation of ESC measures within wetland areas should be done by hand where feasible.</li> <li>• ESC fencing should be tied into the sheet piling in a manner to avoid discharge of sediment and other materials from the work area into the wetland.</li> <li>• ESC measures should be monitored regularly during construction by a qualified inspector.</li> <li>• ESC measures should be maintained in place, and re-enforced (as required), until the access roads and work areas have been rehabilitated, stabilized, restored with native vegetation and when vegetation has become established.</li> <li>• When ESC measures are being removed, removal should be conducted by hand where feasible. Vehicles and other machinery/equipment is not permitted within the wetland restoration areas, or other areas within the wetlands.</li> </ul>

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7.	<p><b>Surface Water</b></p> <p>The works proposed will result in an overall improvement to existing drainage; however, there is the potential for negative impact during construction as noted below:</p> <ul style="list-style-type: none"> <li>• Construction may result in the release of sediment into Kemptville Creek.</li> <li>• Potential spills of fuel, grease, oil, or other deleterious substances to natural areas in areas proximate to Kemptville Creek, or transport of spilled substances to Kemptville Creek</li> </ul>	<p>The following measures are recommended, where possible, to assist in improving water quality.</p> <ul style="list-style-type: none"> <li>• Oil grit separator filtration units are to be installed with the storm sewer network to treat runoff prior to entering Kemptville Creek. Maintenance is recommended annually.</li> <li>• Silt controls are to be installed and monitored to ensure that exposed soils are not susceptible to erosion following precipitation events.</li> <li>• Erosion and sediment control measures must be maintained throughout construction and until vegetation is re-established post construction.</li> <li>• Heavy duty silt fence per OPSD 219.110 around the perimeter of the site with the exception of construction access points and within waterways.</li> <li>• Rock flow check dams per OPSD 219.210 and 219.211.</li> <li>• Sediment traps for dewatering (OPSD 219.240) or sediment bags.</li> <li>• Turbidity curtains within Kemptville Creek (OPSD 219.260 and 219.261).</li> <li>• Sediment control mud mat at the construction access points.</li> <li>• Sediment traps with filter cloth to be installed on all existing ditch inlets and catchbasins within the vicinity of the site.</li> <li>• Erosion blanket if needed for slope protection.</li> <li>• Sheet piling to isolate the in-water bridge pier works.</li> <li>• Stockpiled material should be stored a minimum of 30 m from a waterbody with adequate sediment and erosion controls installed.</li> <li>• OPSS 805 Construction Specification for Temporary Erosion and Sediment Control Measures.</li> <li>• Implement appropriate spill prevention measures. Develop spill response plan with containment/clean-up materials readily available on site.</li> </ul>
8.	<p><b>Groundwater</b></p> <ul style="list-style-type: none"> <li>• The project falls within the Mississippi-Rideau Source Protection Plan and is within the Rideau Valley Source Protection Area. The study area is located within the Kemptville Wellhead Protection Area (WHPA-B), Highly Vulnerable Aquifer area and Significant Groundwater Recharge Area.</li> <li>• Groundwater quality sampling and analysis completed in accordance with Municipality of North Grenville Sanitary and Combined Sewer use and Storm Sewer Discharge By-Law and MECP SCS standards identified some exceedances of the</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor will be required to submit for a Category 3 Permit To Take Water (groundwater) and will be required to adhere to all conditions in the Permit To Take Water. Daily records for dewatering should be maintained and made available for inspection by the MECP.</li> <li>• The contractor will be required to complete water taking (groundwater) in accordance with the requirements of the Ontario Water Resources Act and the Environmental Protection Act.</li> <li>• A discharge permit will be required through consultation with the Municipality of North Grenville.</li> </ul>

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	<p>Sewer Discharge limits and therefore treatment may be required at some locations prior to discharge.</p>	<ul style="list-style-type: none"> <li>• A licensed, specialist dewatering contractor must be retained to install, operate and manage any dewatering wells/arrays in accordance with applicable legislation. The dewatering system would be designed and managed by the dewatering contractor, and since the water exceeds the Sewer Use Bylaw it will require pre-treatment prior to discharge;</li> <li>• Construction dewatering is to be completed in accordance with the monitoring program:                         <ul style="list-style-type: none"> <li>○ <u>Groundwater Level Monitoring</u>: A water level monitoring program is recommended to confirm the extent of influence and monitor potential impacts from the groundwater inflow pumping.</li> <li>○ <u>Groundwater Quality Monitoring</u>: The quality of discharged water should be monitored during construction to ensure compliance with sewer discharge standards.</li> </ul> </li> </ul>
<p>9.</p>	<p><b>Contamination/Waste Management</b></p> <ul style="list-style-type: none"> <li>• There is the potential for excess materials (i.e. old pavement, concrete, asphalt and earth) to be generated during construction.</li> <li>• Detailed design and construction will need to address salt impacts and the proper disposal of potentially contaminated material.</li> </ul>	<ul style="list-style-type: none"> <li>• The removal and movement of soil will follow the recommendations as outlined in the Management of Excess Soil – A Guide for Best Management Practices document prepared by the MECP.</li> <li>• It is recommended that the M&amp;I exceedances in soil at BH20-9 be horizontally and vertically delineated east and west of the Kemptville Creek prior to construction activities to determine the quantity of impacted soil and soil re-use options during construction. Soil determined to be impacted should be re-evaluated to determine suitability for re-use at a receiving site with a less sensitive land use, or be disposed of at a MECP approved waste receiving site following confirmation of non-hazardous waste category through completion of a toxicity characterization leachate procedure (TCLP) sample analysis by an accredited analytical laboratory. It is also recommended that a SPLP sample be collected from the vicinity of BH20-9 to determine on-site soil re-use options.</li> <li>• Soil within the vicinity of BH20-5 from 0.10 to 0.71 m should be re-sampled for OC Pesticides to determine if concentrations are below the applicable Table 2.1 ESQS, due to elevated laboratory detection limits above the Table 2.1 ESQS encountered at this location.</li> <li>• SPLP analysis for OC Pesticides could be conducted on BH20-6, BH20-7, BH20-8, BH20-12 and BH20-13 within the project limits to confirm and inform soil management and disposal options; however, based on the soil analytical results for OC Pesticides, OC Pesticides are not likely a contaminant of concern within the project limits.</li> <li>• Soil within the remaining monitoring locations (with the exception of BH20-9 above) may be re-used within the project limits during construction if construction is to commence before January 1, 2022.</li> </ul>

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		<ul style="list-style-type: none"> <li>• If construction is to commence after January 1, 2022, it is recommended that soil and leachate analysis be conducted on the project limits where excess soil is expected to be generated at the frequency required under Section 8 of O.Reg 406/19.</li> <li>• Groundwater from MW20-7 should be re-analyzed for VOCs to determine if the 1,3 dichloropropylene concentration exceeds the Table 2 SCS, due to an elevated laboratory detection limit encountered for the sample collected from this location.</li> <li>• Following completion of field investigations, if the on-site monitoring wells are no longer required, they should be decommissioned in accordance with O.Reg. 903, as amended.</li> <li>• Develop an Excess Materials Management Plan for identification, assessment, excavation, conveyance, treatment, staging, grading and/or off-side disposal/re-use of soils and aggregate generated during construction.</li> <li>• If potential contamination is encountered the appropriate tests will need be undertaken to confirm the contaminant present and its levels. If the soils are contaminated, disposal will need to be consistent with Part XV.1 of the Environmental Protection Act (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up.</li> <li>• Excess material will require proper management (removal, storage and disposal). Materials shall be managed in accordance with OPSS 180 – General Specification for the Management of Excess Materials.</li> <li>• Where the Contractor manages excess earth as disposable fill, the Contractor shall take into account the possibility of salt impacts and ensure that the material is managed responsibly and in an environmentally appropriate manner. Should any contaminated materials be encountered during the undertaking, caution will be exercised while handling and disposing of contaminated materials in accordance with provincial regulations, and MTO practices (as governed by OPSS 180 or the most current standard at the time of construction).</li> <li>• If asbestos or lead are identified and determined to require abatement, appropriate handling, health and safety abatement and waste disposal protocols will be followed according to the Ontario Environmental Protection Act. – R.R.O 1990 Regulation 347: General – Waste Management and the Ontario Occupational Health and Safety Act – O. Regulation 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations and the Ontario</li> </ul>

I.D. #	Issue/Concern Potential Effects	Mitigation/Protection/Monitoring
		<p>Occupational Health and Safety Act – O. Regulation 490/09: Designated Substance – Lead.</p> <ul style="list-style-type: none"> <li>• Develop spill response plan with containment/clean-up materials readily available on site.</li> </ul>
10.	<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Construction activities have the potential to generate dust and fumes which can negatively impact air quality.</li> <li>• All impacts will be temporary and limited to the period of construction.</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor should utilize best management practices during construction to maintain air quality through construction and include no unnecessary idling of vehicles during construction.</li> <li>• Stockpiles of soil, sand and aggregate should be covered.</li> <li>• Construction sites and access road shall be regularly cleaned to remove debris and dust caused by construction.</li> <li>• Dust suppressants shall be applied to control dust generated by construction activities.</li> </ul>
11.	<p><b>Land Use and Property Impacts</b></p> <ul style="list-style-type: none"> <li>• The project is located in a highly developed area with land use primarily highway commercial with some residential on the south side between County Road 44 and Kemptville Creek and agriculture on the north side between James Street and Kemptville Creek.</li> <li>• The land adjacent to the Kemptville Creek is designated as Provincially Significant Wetland and Floodplain Hazards. The land use east of County Road 19 is primarily Economic Enterprise (integrated mix of highway commercial, industrial and service commercial uses).</li> <li>• It will be important to minimize impacts to area residences and businesses during construction by maintaining traffic flow and property access.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction shall utilize traffic management measures (i.e. construction staging, detours etc.) to minimize impacts to local traffic and to maintain access during construction.</li> <li>• The contractor will be required to maintain access during construction to all entrances. If a temporary entrance closure is needed, the contractor will be required to provide notification to affected property owners, in writing, 48 hours in advance of the closure. The contractor shall also be required to restore all entrances prior to shutting down at the end of the day.</li> <li>• Construction staging should be utilized to ensure that traffic movement is maintained and consist of single lane closures.</li> </ul>
12.	<p><b>Noise</b></p> <ul style="list-style-type: none"> <li>• The main noise sensitive areas are the residential properties located near or adjacent to County Road 43.</li> <li>• Noise during construction will be temporary and limited to the period of construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction should adhere to the municipality's noise by-law. The contractor should be restricted from working during the weekends or on holidays.</li> <li>• Equipment should be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.</li> <li>• The idling of equipment should be restricted to the minimum necessary to perform the specified work.</li> </ul>
13.	<p><b>Archaeological</b></p>	<ul style="list-style-type: none"> <li>• Undertake Stage 2 archaeological assessments required on parcel of land at County Road 44 and Anniversary Way and obtain approval from</li> </ul>

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	<ul style="list-style-type: none"> <li>The project study area has been subject to previous stage 2 archaeological assessments.</li> <li>There are 2 parcels of land that still require stage 2 assessments and approval prior to construction.</li> <li>Apart from the un-assessed parcels, the remainder of the study corridor is unlikely to have any archaeological potential.</li> </ul>	<p>the Ministry of Heritage, Sport, Tourism and Culture Industries prior to construction.</p> <p>In the event that deeply buried archaeological material is encountered during construction the following steps shall be followed:</p> <ul style="list-style-type: none"> <li>In the event that previously unknown or unassessed deeply buried archaeological resources are uncovered during construction, the contractor shall immediately notify the Contract Administrator. Work shall remain suspended within the subject area until otherwise directed by the Contract Administrator in writing. The CA will contact the United Counties of Leeds and Grenville representative who will confirm the need to engage a licensed consultant archaeologist to carry out any archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.</li> <li>In the event that human remains are encountered during construction, the contractor shall immediately notify the Contract Administrator. Work shall remain suspended within the subject area until otherwise directed by the Contract Administrator in writing. The CA will contact the Municipal representative who will notify the police, coroner and the Registrar of the Bereavement Authority of Ontario.</li> </ul>
14.	<p><b>Built Heritage and Cultural Heritage Landscapes</b></p> <p><u>Kemptville Creek Bridge:</u></p> <ul style="list-style-type: none"> <li>The cultural heritage evaluation concluded that the Kemptville Creek Bridge was not a heritage resource.</li> <li>However, since Kemptville Creek is a tributary of the Rideau Canal it is recommended that Parks Canada be consulted to ensure that the national historic features of the Rideau Canal are preserved.</li> </ul> <p><u>Kemptville Cemetery:</u></p> <ul style="list-style-type: none"> <li>The cultural heritage evaluation identified the Kemptville Public Cemetery as a heritage resource within the study area.</li> </ul>	<p><u>Kemptville Creek Bridge:</u></p> <ul style="list-style-type: none"> <li>Consult with Parks Canada in Detailed Design to ensure that the national historic features of the Rideau Canal are preserved.</li> </ul> <p><u>Kemptville Cemetery:</u></p> <ul style="list-style-type: none"> <li>A Qualified Person should be retained to conduct a pre-construction condition assessment of existing landscaping elements of the plantings along the northern shared boundary of the Kemptville Public Cemetery and the County Road 43 right-of-way. Prior to onset of construction activities, landscape elements that will be impacted by the project should be documented. Plantings should be identified, marked, retained during construction and restored based on documentation information prior to construction. If the current plantings cannot be retained and restored, then plant new complimentary vegetation screening along the shared northern boundary. In addition, if a portion of the cemetery is acquired, new vegetative screening (i.e. trees and shrubbery) is recommended along the new proposed property line at the corner of Country Road 43 and Anniversary Way, in order to form a screen between the cemetery and the development of the proposed roundabout. A landscape plan, incorporating these recommendations, should be implemented as part of the final Detailed Design prior to development.</li> </ul>

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		<ul style="list-style-type: none"> <li>• Provincial legislation stipulates that no person is allowed to excavate, alter, or disturb the ground, or remove or disturb a burial object or evidence of past human activity, knowing that the place is a burial ground. Archaeological potential, including all marked and unmarked burials, is a heritage attribute of the Kemptville Public Cemetery. Therefore, consult with the Ministry of Heritage, Sport, Tourism and Culture Industries, and Michael F. D'Mello, Deputy Registrar, Bereavement Authority of Ontario, as part of the Detailed Design phase prior to release of an RFP, regarding any potential physical impact to the cemetery property, in order to determine approvals or permits required.</li> <li>• Staging and construction activities should be suitably planned to avoid impacts to the adjacent identified resource.</li> <li>• Establish no-go zones adjacent to identified cultural heritage resources and issue instructions to construction crews in order to prevent impacts to existing resources.</li> </ul>

