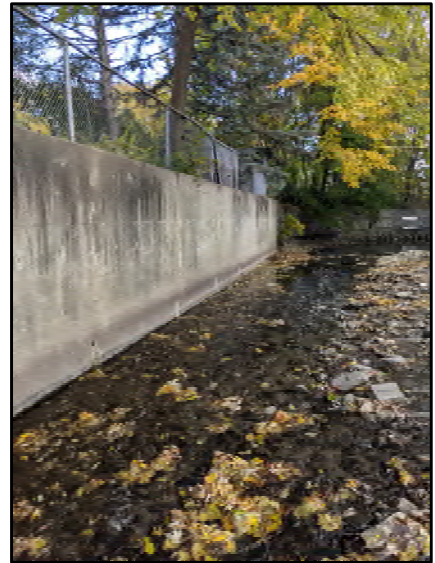




Cooksville Creek Erosion Control Project at Camilla Road
Municipal Class Environmental Assessment Schedule 'B' Project File
February 2024



Prepared for:



Executive Summary

The City of Mississauga (the City) has retained Resilient Consulting and their subconsultants to complete a Schedule B Municipal Class Environmental Assessment (Class EA) for the Cooksville Creek Erosion Control Project, in accordance with the planning process outlined in the Municipal Engineers Association's "Municipal Class Environmental Assessment" document (March 2023).

The Study Area spans approximately 200 metres (m) of Cooksville Creek, roughly 100 m upstream and 100 m downstream of Camilla Road. Downstream (east) of Camilla Road, Cooksville Creek has banks that transition from a concrete vertical wall to Gabion baskets up to three-tiers high. The Gabion baskets have either failed or are at risk of failure due to undermining along the bank. Upstream (west) of Camilla Road, Cooksville Creek consists of a trapezoidal concrete channel that is in poor condition. The Study Area also includes a three-cell culvert at Camilla Road, with an overflow cell along the south banks. The culvert appears to be in good condition, but sediment and debris has begun to accumulate within the structure.

The Problem/Opportunity Statement for this Class EA study is as follows:

The City has identified Cooksville Creek through the Study Area as a high priority site in need of rehabilitation. This section of the creek is entirely channelized via a trapezoidal concrete structure or lined with concrete and Gabion baskets. The Gabion baskets have failed, and the channel walls are slumping and undermined. The concrete-lined channel has fractured bed and banks, and there is a significant amount of accumulated sediment, debris, and vegetation growth obstructing the channel, further reducing its ability to properly drain surface water to Lake Ontario. The deteriorating channel poses a potential risk to infrastructure, private property, and the environment. There is an opportunity to rehabilitate or replace the channel to mitigate risk, in addition to providing other benefits such as improved fish habitat, aesthetic improvements, and reduced maintenance requirements.

The purpose of this Municipal Class EA is to select the preferred upgrade alternative based on comparative evaluation of several possible options, and ultimately to provide a preliminary design. The following four (4) alternative solutions were identified and evaluated for erosion control within the Study Area:

- Alternative 1- Do Nothing
- Alternative 2- Local Improvements
- Alternative 3- Reach Scale Improvements
- Alternative 4- Natural Channel Restoration

Following the evaluation of each alternative against natural, social, economic, and technical criteria, Alternative 3- Reach Scale Improvements, was identified as the preferred solution. This preferred alternative will replace the majority of the existing concrete channel with an armourstone-lined channel along both banks, west of Camilla Road.

As presented at the online Public Information Centre (PIC) in April 2022, the entire concrete channel was originally to be replaced with the armourstone-lined channel. However, following completion of the hydraulic analysis, it was determined that approximately 28 m of the existing

concrete channel, immediately upstream (west) of the Camilla Road bridge, should be retained and repaired to serve as a hydraulic apron (i.e., a foundation) to facilitate water flow under the bridge. East of Camilla Road, the preferred alternative will replace the failed Gabion basket wall with a new armourstone wall along the north bank, and replace the failed Gabion bank protection and the leaning interlocking wall with vegetated rock buttress along the south bank. Additionally, armourstone weirs will be installed in the channel to provide low flow backwater effects. This alternative provides a long-term solution for the City, reduces erosion concerns, increases the hydraulic performance, provides a moderately **'green' solution, minimizes** disturbance, reduces future maintenance costs, and improves fish habitat and passage through the channel.

Indigenous communities and stakeholders, including the public and regulatory review agencies, were consulted throughout the preparation of this study, and their comments and concerns have been addressed where possible.

Construction of the preferred solution is tentatively scheduled to begin in 2025 and will take approximately six (6) to eight (8) months to complete.

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List of Acronyms

cm	centimetre(s)
CVC	Credit Valley Conservation
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
<i>EA Act</i>	<i>Environmental Assessment Act</i>
ha	hectare(s)
km	kilometre(s)
m	metre(s)
mm	millimetre(s)
MCM	Ministry of Citizenship and Multiculturalism
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
PIC	Public Information Centre
SAR	Species at Risk
SWH	Significant Wildlife Habitat

1 Introduction

The City of Mississauga (the City) has retained the services of Resilient Consulting and their subconsultants to prepare this Municipal Class Environmental Assessment (Class EA) study to develop a restoration design for Cooksville Creek that mitigates existing erosion problems and provides long term stability to the channel corridor. The Study Area spans approximately 200 metres (m) of Cooksville Creek, roughly 100 m upstream and 100 m downstream of Camilla Road. The Municipal Class EA identifies various design alternatives to address the failed Gabion basket walls, the fractured bed and banks of the concrete-lined channel, and the accumulation of sediment, debris and in-channel vegetation growth, and ultimately recommends a preferred solution based on evaluation of all examined alternatives.

1.1 Study Area and Background

Cooksville Creek originates in the industrial lands north of Highway 403 before flowing through the Study Area at Camilla Road and ultimately discharging to Lake Ontario at Helen Molasy Park.

The Study Area, shown in Figure 1, extends approximately 100 m upstream and 100 m downstream of Camilla Road. The study reach consists of an engineered channel constructed approximately 30 to 40 years ago. East of Camilla Road, the channel banks transition from a concrete vertical wall to Gabion baskets up to three-tiers high. A trapezoidal concrete channel exists upstream of Camilla Road. The structure at Camilla Road consists of a three-cell culvert structure that includes an elevated overflow cell.

Through the ongoing erosion monitoring program, the City of Mississauga has identified the Study Area along Camilla Road as a high priority site in need of rehabilitation.



Figure 1. Study Area.

1.2 Purpose of the Project File

This Project File documents the planning and preliminary design process and conclusions reached during the preparation of the Cooksville Creek Erosion Control Municipal Class EA study. Problems and opportunities associated with this study were first documented in accordance with the Municipal Class EA process. To address the identified problems, various alternative solutions were then developed and evaluated, resulting in the recommendation of a preliminary preferred solution. This information was then presented to stakeholders through an online (virtual) Public Information Centre (PIC), which was made available for public review and comment between April 13 and May 4, 2022. This Project File documents the full extent of this process and is structured for ease of public review.

2 Planning Context

The following section provides an overview of the planning context behind the proposed works, including why this study was required, the Municipal Class EA planning process, and the various legislative and policy considerations behind it.

2.1 Environmental Assessment Act

The *Environmental Assessment Act (EA Act)* was passed by the Ontario government in 1976 and first applied to municipalities in 1981. The *EA Act* requires proponents to study, document, and examine all potential environmental impacts that could result from major projects or activities prior to construction. The process is intended to result in the selection of a project alternative that has the fewest environmental impacts. In this context, the *EA Act* broadly defines the environment as:

- Air, land or water;
- Plant and animal life, including human life;
- The social, economic and cultural conditions that influence the lives of humans or a community;
- Any building, structure, machine or other device or thing made by humans;
- Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or
- Any part or combination of the foregoing and the interrelationships between any two (2) or more of them.

The *EA Act* applies to major public sector projects and designated private sector projects that have the potential for significant environmental effects. All municipalities in Ontario, including the City of Mississauga, are subject to the provisions of the *EA Act* and its requirements to conduct an EA for applicable projects.

2.2 Municipal Class EA Planning Process

The Municipal **Engineers Association “Municipal Class Environmental Assessment” document** (March 2023) outlines a planning process, approved under the *EA Act*, for municipal projects having a predictable range of environmental impacts and applicable mitigation measures. This study follows the planning and design process outlined within this document as it allows the City

of Mississauga to achieve the requirements of the *EA Act* for municipal infrastructure without having to either undertake an Individual EA or request a specific exemption for the project. Municipal projects included in the Class EA may be implemented without further approval under the *EA Act*, provided that the approved Class EA planning and design process is followed (refer to Figure 3).

2.2.1 Municipal Class EA Project Schedule

Since projects undertaken by municipalities vary in their environmental effects, the Municipal Class EA document classifies these projects into four (4) schedules depending on the anticipated level of environmental impact:

- Exempt projects (previously referred to as Schedule A or A+ projects) are limited in scale, have minimal adverse effects, and include the majority of municipal maintenance and operation activities. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases, and there is no ability for the public to request a Section 16 Order (see Section 2.3 below for further explanation).
- Eligible for Screening to Exempt projects are eligible for exemption from the *EA Act* based on the results of the archaeological screening process and the collector roads screening process (where applicable), as outlined in the Municipal Class EA document, Appendix 1. Completion of the screening process(es) is voluntary and proponents may instead choose to proceed with the Schedule B or C process instead.
- **Schedule 'B'** projects have the potential for some adverse environmental effects. The municipality or proponent is required to undertake a screening process (Phases 1 and 2) involving mandatory contact with the directly affected public, relevant review agencies, and Indigenous communities to ensure that they are aware of the project and that any **concerns they may have are addressed, where possible. Schedule 'B' projects require that a Project File (EA Report) be prepared and made available for review by all interested parties.** If the Class EA process is followed and there are no outstanding concerns, then the proponent may proceed to Phase 5 for implementation.
- **Schedule 'C'** projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Municipal Class EA document (Phases 1 to 4). **Schedule 'C' projects require that an Environmental Study Report be prepared and made available for review by all interested parties.** If the Class EA process is followed and there are no outstanding concerns, then the proponent may proceed to Phase 5 for implementation.

Due to the nature of this project, this study is being undertaken under the Municipal Class EA process for **Schedule 'B' projects. As per Appendix 1, Table B of the Municipal Class EA document, projects that are subject to the Schedule 'B' planning process include:**

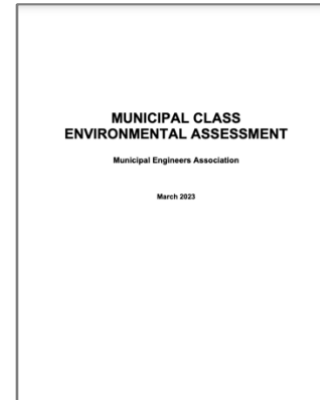


Figure 2. EA Planning and Design Process

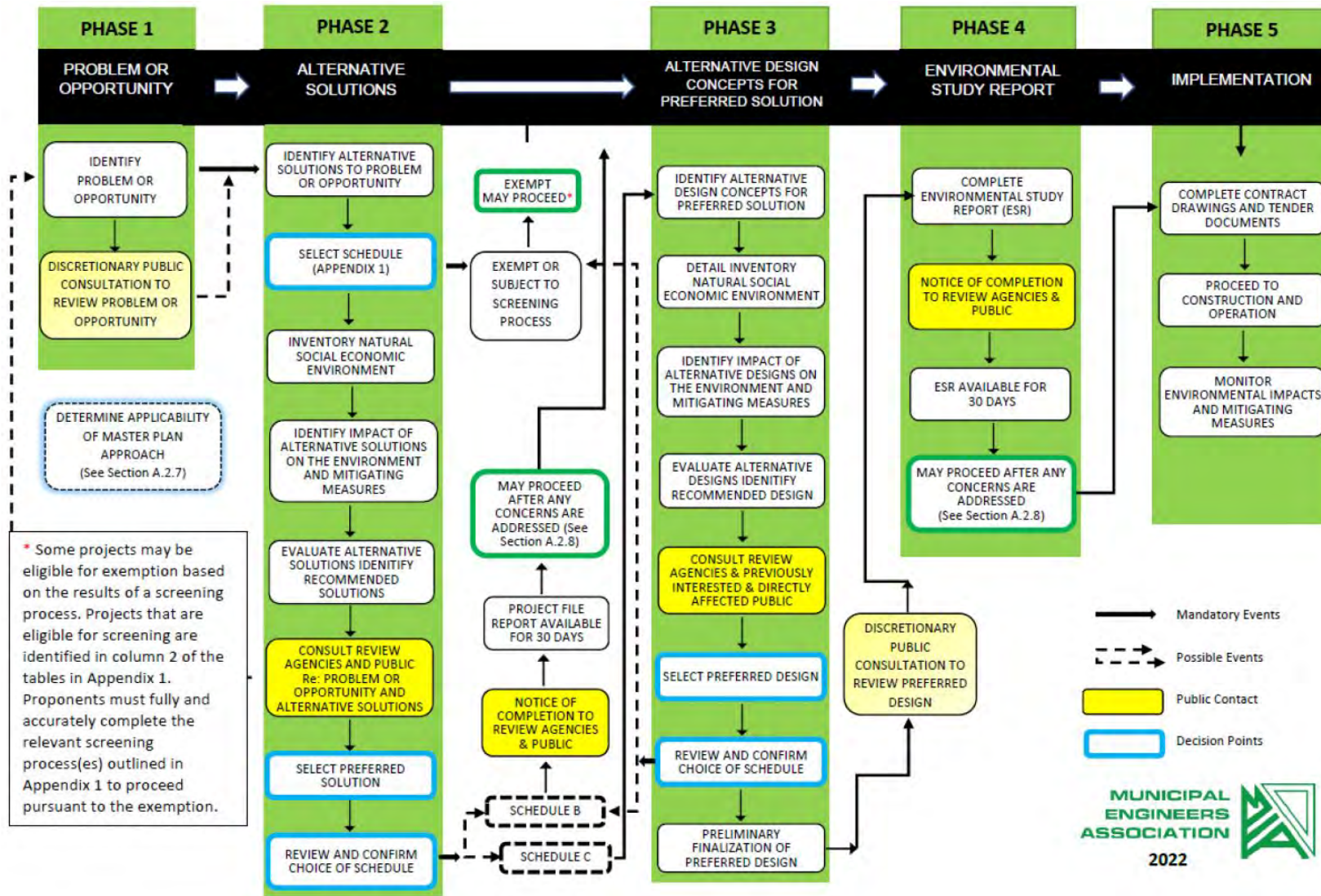


Figure 3. Municipal Class Environmental Assessment Planning Process
(Municipal Engineers Association, March 2023)

51. Works undertaken in a watercourse for the purposes of flood control or erosion control, which may include:

- Bank or slope regrading
- Deepening the watercourse
- Relocation, realignment, or channelization of a watercourse
- Revetment including soil bio-engineering techniques
- Reconstruction of a weir or dam.

As this project involves regrading of the banks of the existing channel, and other works within the watercourse for the purpose of erosion control, it is **classified as a Schedule 'B'** project.

2.2.2 Climate Change Considerations

The Ministry of the Environment, Conservation and Parks (MECP) has prepared a guide entitled **"Considering Climate Change in the Environmental Assessment Process"** which sets out how climate change must now be considered in Class EA studies. Specifically, each study must consider: the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and the resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation). Section 7.2 summarizes how the proposed Cooksville Creek Erosion Control upgrades have addressed both climate change mitigation and adaptation.

2.3 Public Review of this Report and Next Steps

Following finalization of the Project File, this document will be placed on public record and made available for review and comment by any interested parties for a period of 30-calendar days. During this comment period, anyone has the right to raise comments or concerns, which can be addressed to the following Project Team representatives:

Anthony DiGiandomenico, P.Eng.
Project Manager
City of Mississauga
300 City Center Drive
Mississauga, ON L5B 3C1
905.615.3200 x. 3491
anthony.digiandomenico@mississauga.ca

Mark Bassingthwaite, P.Eng.
Project Manager
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
289.943.4651
mbassingthwaite@resilientconsulting.ca

In the event that any concerns cannot be resolved, individuals can request that the Minister of the Environment, Conservation and Parks make an "order" under Section 16 of the *EA Act* that a higher level of study approvals be required, i.e., a comprehensive or Individual EA. Alternatively, they may request that conditions such as further study be imposed. Amendments to the *EA Act*

through Bill 197, *Covid-19 Economic Recovery Act*, 2020, note that such a request (formerly **referred to as a “Part II Order”** request) will only be considered by the Minister if the project impacts constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered.

Requests should specify what kind of order is being requested (i.e., a request for conditions or a request for an Individual EA), how an order may prevent, mitigate or remedy potential adverse impacts on Aboriginal and treaty rights, and any information in support of the statements in the request. This will ensure that the Ministry is able to efficiently begin reviewing the request.

Written requests must be submitted by the end of the 30-calendar day comment period, April 4, 2024, to both the following addresses:

Minister of the Environment, Conservation and Parks
Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, ON M7A 2J3
minister.mecp@ontario.ca

and,

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5
EABDirector@ontario.ca

Requests should also be copied to the Project Team members listed above. Further details on the process to request a Section 16 Order can be found on the Ontario government website: <https://www.ontario.ca/page/class-environmental-assessments-section-16-order#section-3>.

If the Minister agrees with the request, the project will be subject to Part II of the *EA Act* and the City of Mississauga shall begin with preparing a Term of Reference for an Individual EA. If the Section 16 Order request is denied by the Minister, the project is considered to have met the requirements of the Class EA and the project may proceed to detailed design and construction as outlined in this document. Alternatively, the Minister may impose additional conditions which must be met before proceeding.

2.4 Legislative and Policy Considerations

As with all municipalities in Ontario, the City of Mississauga must operate according to the planning frameworks established by senior levels of government. Among other administrative, legislative, and financial frameworks, this includes policies and legislation established by the Federal Government, the Province of Ontario, and the Region of Peel. In addition, the Ontario *Planning Act* requires that lower tier municipalities such as the City of Mississauga prepare their own Official Plans to govern land use. The following sections discuss the applicable legislation and relevant planning policies considered as a part of this study.

2.4.1 Federal Legislation

The following sub-sections provide further details regarding Federal legislation relevant to this study, including the *Canadian Impact Assessment Act*, *Fisheries Act*, *Migratory Birds Convention Act*, and the *Species at Risk Act*.

Impact Assessment Act

The Canadian *Impact Assessment Act* (2019) sets out the responsibilities and procedures for carrying out a Federal EA for major projects and projects which have the potential to cause environmental impacts in areas of federal jurisdiction. The Act only applies to those projects designated under the “**Physical Activities Regulations**” (or Project List). Following review of the proposed project, there are no physical activities proposed that match any activities listed the regulations. Therefore, meeting the requirements of the Canadian *Impact Assessment Act* is not required.

Fisheries Act

The *Fisheries Act* (2019) regulates the harm and destruction of fish and fish habitat in Canadian waterways. Proponents are responsible for determining if the project is likely to cause impacts or harm to fish and fish habitat, and if these impacts can be avoided or mitigated. Modifications to Cooksville Creek below the highwater mark may be regulated under the *Fisheries Act* and will require review and/or authorization by Fisheries and Oceans Canada (DFO).

Migratory Birds Convention Act

The purpose of the *Migratory Birds Convention Act* (1994) is to protect migratory birds, their eggs, and their nests from harm or destruction. Canada seasonally hosts approximately 450 species of native birds, with the majority protected under the Act. The timing for any required tree/vegetation clearing during construction within the Study Area must be informed so as not to contravene the *Migratory Birds Convention Act*. Typically, in southern Ontario, the timing window for vegetation clearing is September 1 to March 31 (i.e., avoid vegetation clearing between April 1 and August 31).

Species at Risk Act

The purpose of the *Species at Risk Act* (2002) is to protect wildlife species that are extirpated, endangered, or threatened as a result of human activity, and to manage species of concern to prevent them from becoming endangered or threatened. The Act applies to any activity with the potential for disturbance or destruction of any Federally listed aquatic Species at Risk (SAR) or their habitat, as well as any Federally listed terrestrial SAR or their habitat on Federal land. However, following preliminary field investigations, no aquatic or terrestrial SAR were confirmed within the Study Area. Measures to mitigate against negative impacts to potential SAR are recommended. Additional field investigations may also be completed during detailed design to confirm the absence of SAR.

2.4.2 Provincial Policies and Legislation

The following sub-sections provide further details regarding Provincial policies and legislation relevant to this study, including the Provincial Policy Statement, Growth Plan for the Greater

Golden Horseshoe, *Clean Water Act*, *Endangered Species Act*, *Conservation Authorities Act*, and the *Ontario Heritage Act*.

Provincial Policy Statement



Figure 4. **Ontario's** Provincial Policy Statement

Ontario's Provincial Policy Statement, 2020, under the *Planning Act* provides direction to municipalities on matters related to land use planning and development. The Provincial Policy Statement supports improved land use planning and management, while protecting natural resources of provincial interest, public health and safety, and the quality of the natural and built environment. Sections 1.6, 2.1 and 2.2 apply to the proposed channel upgrade works and were taken into consideration during the evaluation of the design alternatives.

Section 1.6 of the Provincial Policy Statement provides direction to municipalities regarding infrastructure and public service facilities, which includes stormwater services. Specifically, Section 1.6.6.7 states that planning for stormwater management shall:

- a) be integrated with planning for sewage and water services and ensure that systems are optimized, feasible and financially viable over the long term;
- b) minimize, or where possible, prevent increases in contaminant loads;
- c) minimize erosion and changes in water balance, and prepare for the impacts of a changing climate through the effective management of stormwater, including the use of green infrastructure;
- d) mitigate risks to human health, safety, property and the environment; and
- e) promote stormwater management best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development.

Section 2.1 of the Provincial Policy Statement promotes the protection of natural heritage features and functions, including the fish habitat (although limited), significant woodlands, and Significant Wildlife Habitat (SWH) within the Study Area (see Section 4.2 below). Section 2.1.5 prohibits development and site alteration in significant natural heritage features, including SWH, unless it has been demonstrated that there will be no negative impacts on those features and their ecological function. Section 2.1.6 prohibits development and site alteration in fish habitat, except in accordance with Provincial and Federal requirements.

Section 2.2 of the Provincial Policy Statement similarly promotes the protection, improvement, or restoration of water resources. Relevant to this study, Section 2.2.1 i) states that planning authorities must ensure that stormwater management practices minimize stormwater volumes and contaminant loads and maintain or increase the extent of vegetative and pervious surfaces.

Growth Plan for the Greater Golden Horseshoe

Ontario's "A Place to Grow: Growth Plan for the Greater Golden Horseshoe" (2020) builds upon the Provincial Policy Statement by outlining a plan for **growth and development that "supports economic prosperity, protects the environment, and helps communities achieve a high quality of life"**. Relevant excerpts for this project include Policy 4.2.10.1 d) regarding climate change which states that municipalities shall undertake stormwater management planning in a manner that assesses the impacts of extreme weather events and incorporates appropriate green infrastructure and low impact development.



Figure 5. Ontario A Place to Grow Policy

Clean Water Act

The *Clean Water Act* (2006) mandates source water protection, otherwise known as the protection of drinking water resources. In Ontario, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system located in a source protection area. These include:

- Wellhead Protection Areas;
- Surface water Intake Protection Zones;
- Highly Vulnerable Aquifers;
- Significant Groundwater Recharge Areas;
- Event-based modelling areas; and
- Issues Contributing Areas.

The Study Area falls within the plan jurisdiction of the Credit Valley Source Protection Area and is located within an Intake Protection Zone-2 where water and pollutants can reach the drinking water intake within approximately two (2) hours. As such, applicable policies of the Credit Valley Source Protection Plan apply.

The "Approved Source Protection Plan: CTC Source Protection Region" (2022) includes several policies pertaining to Intake Protection Zones which are primarily related to the storage, handling and application of road salt and the handling and storage of potentially hazardous substances. As noted in Section 8.3 below, a Spills Management Plan will be prepared during the construction phase of the project to ensure spills prevention and an appropriate response should a spill occur during construction. No other potential threats or risks to drinking water resources as a result of this project are anticipated.

Endangered Species Act

The purpose of Ontario's *Endangered Species Act* (2007) is to protect provincially listed Species at Risk (SAR) and their habitats. These include those species and habitats classified as Endangered or Threatened under the Act. Species classified as Special Concern under the *Endangered Species Act* do not receive these protections, however their habitat is protected from development under the Provincial Policy Statement. Section 4.2.4 below discusses the potential for SAR within the Study Area.

Conservation Authorities Act

The purpose of the *Conservation Authorities Act* (1990) is to give authority to Credit Valley Conservation (CVC) and other Conservation Authorities within Ontario to regulate development, interference with wetlands, and alterations to shorelines and watercourses. Under Ontario Regulation 160/06, CVC regulates development located within the Credit River watershed, including within and adjacent to creeks, valley lands, shorelines, and wetlands. Permission may be granted for development within these regulated areas if the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land will not be affected by the development. As Cooksville Creek is located within a regulated area, a permit to complete the proposed work will be required from CVC.

In CVC's "Watershed Planning and Regulation Policies" (2010), key policies apply to the proposed works as follows:

- Policy 5.3.3.6, Watercourses and Fish Habitat – d) CVC will not permit the straightening, changing, diverting or interference with the existing channel of a watercourse, except in accordance with the policies in Chapter 7
- Policy 7.2.5, Interference with a Watercourse – a) Major interference with a watercourse (including, but not limited to, realignment, lowering, enclosure and dam and pond construction) is generally not permitted. Such interference may be permitted where it has been demonstrated, to the satisfaction of CVC, that:
 - i. acceptable justification has been provided through an environmental assessment or comprehensive environmental study;
 - ii. the works are subject to conformity with municipal planning documents; and
 - iii. the interference is acceptable for the natural features and ecological functions and hydrologic functions of the watercourse.
- b) Minor interference with a watercourse (including, but not limited to, culverts and restoration projects) may be permitted where it has been demonstrated, to the satisfaction of CVC, that:
 - i. the natural topography of the watercourse system, flood storage and flood conveyance are maintained to the extent feasible;
 - ii. there are no unacceptable adverse impacts to fluvial processes (including meander belt);
 - iii. there are no unacceptable adverse impacts on groundwater recharge/discharge;
 - iv. geotechnical issues are adequately addressed;
 - v. the recommendations within the comprehensive environmental studies for the area have been implemented; and
 - vi. the interference is acceptable for the natural features and ecological functions and hydrologic functions of the watercourse.

- Policy 7.2.6, Infrastructure Policies – a) CVC recognizes that certain types of interference or development related to infrastructure by their nature must locate within hazardous land, watercourses, wetlands and natural features and areas contributing to the conservation of land and associated setbacks. Considering this, CVC may permit such works where all reasonable alternatives have been explored and determined not to be feasible through an environmental assessment, comprehensive environmental study or technical report supported by CVC, and subject to the following:
 - i. The interference is acceptable and/or it has been demonstrated that, in the opinion of CVC, that the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected. This includes, but is not limited to:
 - a. all works must be constructed in such a manner as to prevent unacceptable increases in flood hazards, erosion hazards and associated effects on upstream and downstream properties. All reasonable efforts to eliminate or minimize impacts on flood hazards and erosion hazards must be implemented;
 - b. the location and design of bridges and culverts must be consistent with CVC standards. Where feasible, bridge and culvert abutments or piers should be located outside of the meander belt allowance or the one hundred year erosion limit of any watercourse;
 - c. the safe passage of flood flows should not be impeded. Where feasible, structural abutments or piers should be located outside of the flood hazard **to minimize obstruction to water flows; ...**
 - g. ecological linkages and corridors should be incorporated into the design of all works. The design of infrastructure should maintain, and where possible, improve or restore ecological linkages where appropriate;
 - h. the area of construction disturbance is minimized to the extent feasible;
 - i. natural features, ecological functions and hydrologic functions contributing to the conservation of land are not affected. Where unavoidable, adverse impacts must be minimized to the extent feasible and mitigation measures implemented to the satisfaction of CVC; and
 - j. the interference is acceptable for the natural features and ecological functions and hydrologic functions of the wetland or watercourse.
- Policy 7.7, Sediment and Erosion Control Policies – a) CVC will require that all applications for development within a regulated area include erosion and sediment control plans prepared in accordance with CVC standards.

Ontario Heritage Act

The purpose of the *Ontario Heritage Act* (1990) is to identify and protect archaeological resources, built heritage resources, cultural heritage landscapes, and heritage properties within Ontario. Archaeological resources include artifacts or physical evidence of past human use or activity that is of cultural value or interest. Stage 1 and Stage 2 Archaeological Assessments were completed

as a part of this study to confirm no potential impacts on archaeological resources. Further details are provided in Section 4.5.1 below.

Built heritage resources are typically individual buildings or structures associated with a variety of human activities such as historical settlement or patterns of architectural development. Generally, buildings or structures more than 40-years old may have heritage value. A cultural heritage landscape is a collection of individual built heritage resources and other related features that together form farm complexes, roadscape, and/or settlements. Further, cultural heritage landscapes are geographical areas that may have been changed by human activity over time and have been identified as having cultural heritage value or interest by a community, including Indigenous communities. A cultural heritage landscape may include buildings, structures, spaces, views, archaeological sites, or natural elements. Section 4.5.2 below details cultural heritage resources that were identified within the Study Area. 2130 Camilla Road is a heritage listed property in the vicinity of the project. It was determined that there is a very low potential for impact on the heritage home as no work is proposed in the immediate vicinity of the home.

2.4.3 Municipal Policies

Cooksville Creek's floodplain has been identified as a Natural Hazard **and part of the "Green System"** as per Schedules 1a and 3 of the Mississauga Official Plan (July 27, 2023). Therefore, the potential for development and site alterations within this area is limited. However, upgrades along the creek banks within the Study Area are required for erosion control, which are permitted according to Official Plan policy 11.2.3.2d.

3 Problem or Opportunity Statement

Phase 1 of the Municipal Class EA planning process defines the starting point for any Class EA as the **"Problem or Opportunity Statement."** This statement assists in defining the scope of the project and serves as its central theme and integrating element.

3.1 Problem

The City has identified Cooksville Creek through the Study Area as a high priority site in need of rehabilitation. This section of the creek is entirely channelized via a trapezoidal concrete structure or lined with concrete and Gabion baskets. The Gabion baskets have failed, and the channel walls are slumping and undermined. The concrete-lined channel has a fractured bed and banks, and there is a significant amount of accumulated sediment, debris, and vegetation growth obstructing the channel, further reducing its ability to properly drain surface water to Lake Ontario. The deteriorating channel poses a potential risk to infrastructure, private property, and the environment.

3.2 Opportunity

There is an opportunity to undertake rehabilitation/replacement of the channel to mitigate risk. Project objectives include:

- Providing long term erosion protection compatible with the creek;
- Maintaining the hydraulic capacity of the creek;

- **Replacing the hardened creek bed and banks with more “natural” forms of erosion and grade control;**
- Providing environmental enhancements and improving fish habitat and fish passage;
- Decreasing risk of property and infrastructure loss; and
- **Reducing the City’s maintenance costs.**

The City of Mississauga initiated this Municipal Class EA to identify and evaluate alternative solutions to address these problems and opportunities.

4 Inventory of Existing Conditions

Phase 2 of the Municipal Class EA planning process requires a general inventory of the natural, cultural and socio-economic environments to be considered. It also requires that significant features and potential impacts be identified early in the planning process where possible, so that significant features can be avoided, or efforts can be made to mitigate (reduce) adverse impacts. This chapter summarizes the environmental inventory completed.

To collect information on the existing conditions within the Study Area, field visits were undertaken by the Project Team, in combination with the completion of desktop reviews of available background information, where applicable. Supporting studies completed as part of this process are found in the Appendices as noted throughout this section.

4.1 Existing Channel Condition

The Study Area extends approximately 100 m upstream and 100 m downstream of Camilla Road. The study reach consists of an engineered channel constructed approximately 30 to 40 years ago. East of Camilla Road, the Study Area has banks that transition from an approximately 48 m long and 2.1 m high concrete vertical wall to Gabion baskets up to three-tiers high on the north side, and Gabion baskets, leaning interlock retaining wall, and chain link fence on the south side. The channel bed substrate consists of boulders, cobble, gravel, and sand. The concrete wall is in good condition, however the Gabion baskets have either failed or are at risk of failure due to undermining along the bank. The channel downstream (east) of Camilla Road and associated failed gabion baskets are shown in Figure 8 and Figure 9 below.

West of Camilla Road, the Study Area consists of a trapezoidal concrete channel that is in poor condition, shown in Figure 6. Based on the field survey completed by Resilient in November 2021, the trapezoidal concrete channel has an approximate average base width of approximately 5 m, height of 1.1 m, and a bank slope of 2.5:1. The concrete-lined channel has a fractured bed and banks. The Study Area also includes a three-cell culvert at Camilla Road, as seen in Figure 7, with an overflow cell along the south banks. The culvert appears to be in good condition, but sediment and debris has begun to accumulate within the structure.

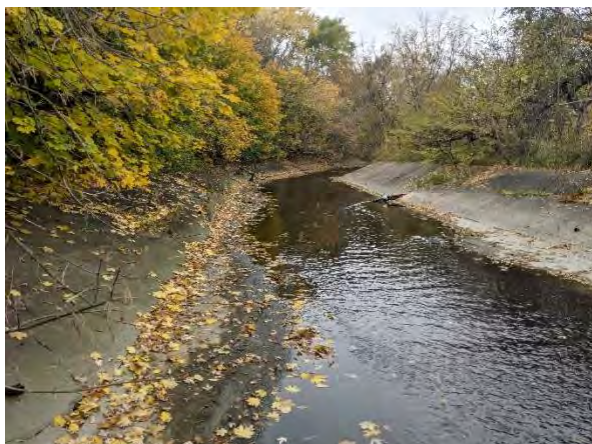


Figure 6. Trapezoidal concrete channel (looking upstream)



Figure 7. 3-cell Culvert at Camilla Road (looking upstream)



Figure 8. Channel banks transition from concrete vertical wall to Gabion baskets (looking downstream)



Figure 9. Failed Gabion baskets along creek bank

4.1.1 Cooksville Creek Flood Evaluation Master Plan EA

According to the Cooksville Creek Flood Evaluation Master Plan EA (Aquafor Beech Ltd., 2012), the Cooksville Creek watershed exhibits a “flashy hydrologic response” typical of highly urbanized watersheds developed without the benefits of updated stormwater management infrastructure. Flooding and drainage issues exist within the watershed in areas where development has reduced channel conveyance and restricted floodplain capacity, which has sometimes caused backwaters to flood upstream reaches.

The Cooksville Creek Flood Evaluation Master Plan EA (Aquafor Beech Ltd, 2012) also notes that many of the road crossings along Cooksville Creek would be overtopped or bypassed by flows that range from the 2-year storm to the Regional storm. Camilla Road is overtopped by all flows exceeding the 10-year storm flow. To mitigate flood damages, Aquafor Beech recommended the following alternatives within the Cooksville Creek watershed: crossing capacity upgrade, watercourse capacity upgrade, dykes/berms, reservoirs, building flood proofing, and diversions.

4.2 Natural Environment

A Natural Heritage report (Appendix A) was prepared by North-South Environmental (February, 2022). The report provides a detailed description of the existing natural heritage features and functions within the Study Area and summarizes potential natural heritage constraints which were taken into consideration during evaluation of the erosion control alternatives. North-South Environmental completed a thorough background review of existing information pertaining to natural heritage features, and conducted both a fish habitat assessment and terrestrial resources assessment (i.e., ecological land classification, botanical inventory, and incidental wildlife and notable trees surveys) on October 19, 2021. Key findings are summarized in the sub-sections below.

4.2.1 Fish and Aquatic Habitat

Cooksville Creek has a warmwater thermal regime. Land Information Ontario mapping indicates 16 fish species are present within Cooksville Creek, including the reach where the Study Area is located. However, none of these fish species include Species at Risk (SAR), and the Cooksville Creek Characterization Report (Aquafor Beech, 2011) states that no fish are present within Cooksville Creek north of the QEW due to fish barriers limiting movement upstream. Fish barriers are present at the rail crossing north of Lakeshore Road East and at Atwater Avenue. Furthermore, no fish were observed during North-South Environmental surveys, and fish habitat is limited due to channel design. There may however, be potential for fish to be present during high-flow storm events.

There is an opportunity for moderate improvement to fish habitat by removing and replacing the concrete bed with natural substrate. Although fish habitat is limited within the Study Area, a Request for Review by Fisheries and Oceans Canada under the *Fisheries Act* will be required for all work proposed within the channel.

4.2.2 Vegetation

The Study Area is classified as Fresh-Moist Ash Lowland Deciduous Forest Type, which includes a significant amount of dead or dying Ash (*Fraxinus* spp.) in the canopy. The live canopy is dominated by Manitoba Maple (*Acer negundo*), Crack Willow (*Salix fragilis*), American Elm (*Ulmus americana*), and Norway Maple (*Acer platanoides*) (25-60% cover, 10-25 m in height). Scattered mature willows are present along the creek banks.

Within the Camilla Natural Area (which includes the Study Area) (Figure 10) which was previously surveyed by North-South Environmental during other work for the City, a total of 198 floral species have been observed, including 90 non-native species (i.e., 45% of the total species present), five of which are considered highly invasive.

No significant trees (i.e., those with a diameter at breast height of more than 150 cm) were identified within the Study Area. However, notable trees in the Study Area include mature maple and willow trees, which have some ecological and aesthetic significance based on their maturity. **Freeman's Maple** (*Acer x freemanii*) and Silver Maple (*Acer saccharinum*) are native trees that should be retained, if possible (though they do not receive protection under provincial or municipal legislation). Crack Willow and Norway Maple (*Acer platanoides*), while mature trees, are non-native.

All treed portions present within the Study Area meet criteria in the City of Mississauga Official Plan for “significant woodland” (i.e., more than 0.5 ha in size and located within 30 m of a watercourse). Significant woodlands automatically meet criteria as Significant Natural Areas.

Development and site alteration within or adjacent to Significant Natural Areas is not permitted by the City unless all reasonable alternatives have been considered and any negative impacts have been minimized. Therefore, the preferred solution will limit tree removals, and any negative impact that cannot be avoided will be mitigated through restoration and enhancement to the greatest extent possible. Further, an opportunity exists within the Study Area to improve the overall native species composition through the removal of invasive and non-native species and replacement with native plantings and seedlings.

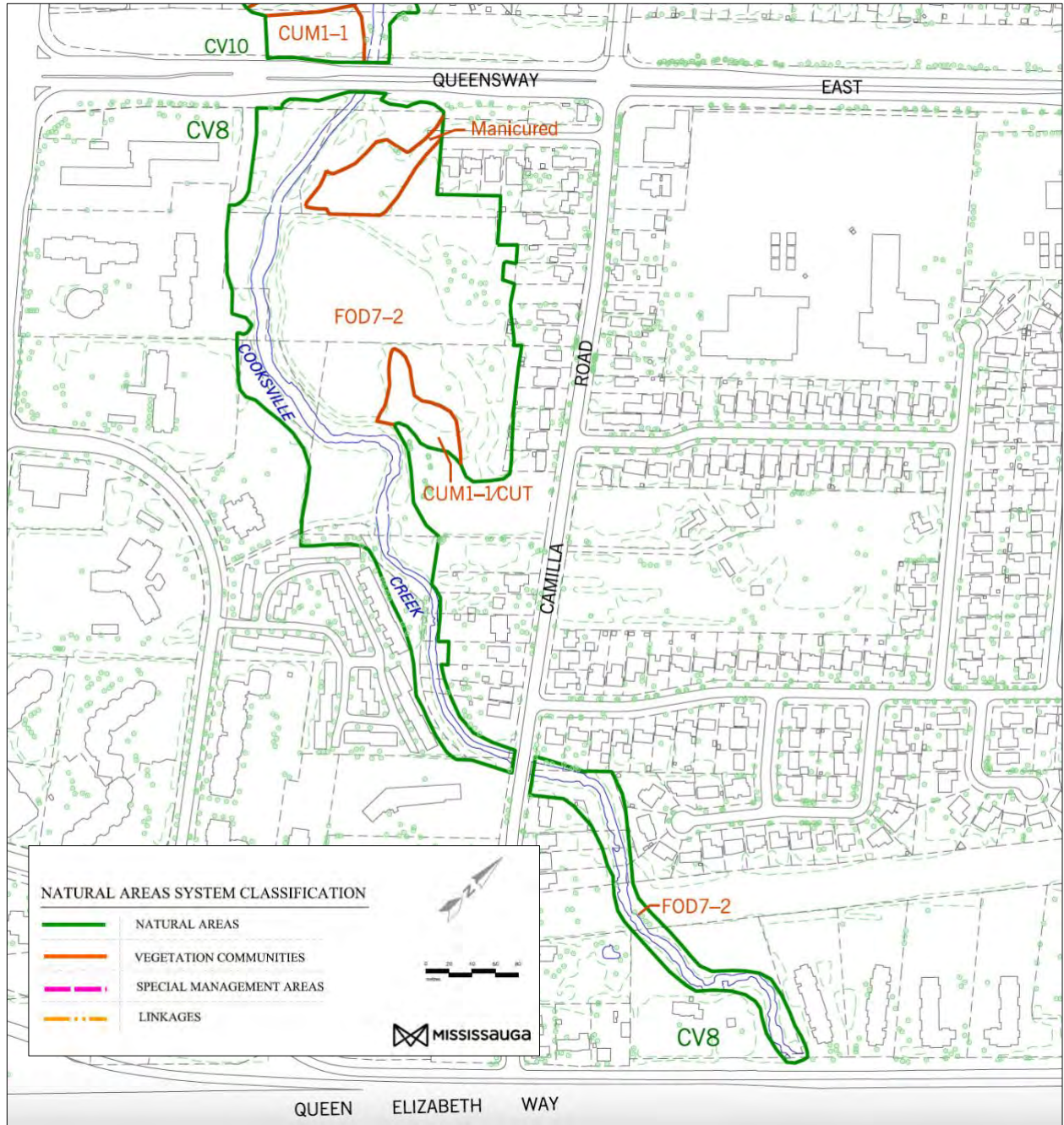


Figure 10. Camilla Natural Area (CV8)
(City of Mississauga Natural Areas Study, 2021)

4.2.3 Wildlife and Significant Wildlife Habitat

Within the Camilla Natural Area (which includes the Study Area) which was previously surveyed by North-South Environmental during other work for the City, a total of 41 fauna (wildlife) species have been observed, including 37 bird species and four mammal species. No additional species

were found in the Study Area that were not already known from the previous Camilla Natural Area Survey.

Significant Wildlife Habitat (SWH) was identified in the Study Area by CVC, including deer congregation areas and migratory land bird stopover habitat. In addition, mature deciduous trees (especially Maples and Oaks) may provide suitable cavities or peeling bark which can be used as habitat for bat maternity colonies. However, in the absence of targeted bat surveys, it is assumed that potential bat maternity colonies may be present and appropriate mitigation measures will be applied (i.e., seasonal timing windows for vegetation removal, if required).

Candidate SWH for reptile hibernaculum (winter shelter) cannot be determined without spring or fall surveys for congregating snakes. However, their preferred habitat is not present (i.e., talus, rock crevices) in the Study Area, and reptile hibernaculum habitat is uncommon on the landscape. Therefore, the presence of reptile hibernaculum within the Study Area is considered unlikely.

Candidate SWH for the following Species of Conservation Concern and provincially rare wildlife species were also identified within the Study Area:

- Eastern Wood-pewee
- Snapping Turtle
- Eastern Small-footed Myotis
- Little Brown Myotis
- Northern Long-eared Myotis

There is an opportunity to moderately improve wildlife habitat by removing terrestrial invasive species where possible and installing native plantings. To mitigate impacts to SWH within the Study Area, tree removal will be minimized, and if feasible, vegetation clearing will occur outside of the breeding bird and active bat seasons. Bat and/or bird nesting surveys may be completed during the detailed design stage of the project if vegetation clearing timing windows cannot be adhered to.

If turtles or snakes are encountered during construction, whenever possible, work should be **temporarily suspended until the species is out of harm's way**.

4.2.4 Species at Risk

No SAR have been confirmed within the Study Area, though SAR birds, turtles and bats have previously been found in the Camilla Natural Area (which includes the Study Area). Species that have moderate to high potential to occur in the Study Area are:

- Butternut
- Midland Painted Turtle
- Snapping Turtle
- Barn Swallow
- Eastern Wood-pewee
- Small-footed Bat, Little Brown Myotis, Northern Long-eared Myotis

No Butternut trees were observed in the Study Area, though suitable habitat is present. Midland Painted Turtles and Snapping Turtles were also not observed in the Study Area, and only marginal habitat is present due to the level of channel disturbance, aquatic barriers to movement, and

barriers to terrestrial movement due to urban conditions. However, there is moderate potential for these species to be present. If these turtles do use the Study Area, it is expected that use would not include overwintering or nesting. If a SAR turtle enters the work zone it should be permitted to leave on its own, or if that is not possible, the onsite inspector should be contacted for guidance. Active nests will be protected, or if that is not possible, the onsite inspector or MECP will be contacted for guidance.

Barn swallow and Eastern wood-pewee have been recorded within the Camilla Natural Area. Barn swallow may forage within the Study Area and/or nest on structures (i.e., Camilla Road bridge), and Eastern wood-pewee may nest within the forested area. Similarly, there is potential for SAR bats to forage within the Study Area or roost within the forested area. To mitigate impacts to these species, tree removal will be minimized, and if feasible, vegetation clearing will occur outside of the breeding bird and active bat seasons. Bat and/or bird nesting surveys may be completed during the detailed design stage of the project if vegetation clearing timing windows cannot be adhered to.

4.3 Geotechnical Environment

A desktop review of geotechnical background information was completed by the Project Team. Based on review of Ontario Geological Survey mapping, the subsurface condition within the Study Area is anticipated to be comprised of modern alluvial deposits consisting of clay, silt, sand, gravel, and possibly organic remains. The bedrock is expected to be of the Georgian Bay formation, which is comprised of shale, limestone, dolostone and siltstone.

Based on public well records available through the MECP, the surface of bedrock within the Study Area generally occurs at depths greater than 3.5 m below ground surface. The typical stratigraphy documented in these records include surface fill and clay with silt above shale. Further geotechnical investigations will be completed during the design phase.

4.4 Socio-Economic Environment

The Study Area backs onto residential areas east and west of Camilla Road as per the City of Mississauga Zoning By-Law mapping (2022) shown in Figure 11. This includes detached dwellings east of Camilla Road and an apartment building, townhouses, and detached dwellings west of Camilla Road. The majority of the channel is located on lands owned by the City, or private properties which have City easements for creek improvement purposes. Camilla Road is a minor collector road with dedicated bicycle lanes.

4.5 Cultural Environment

The cultural environment includes archaeological and cultural heritage resources. This information is summarized in the sub-sections below based on the Stage 1 and 2 Archaeological Assessments completed as part of this study, and review of **the City's** online heritage information.

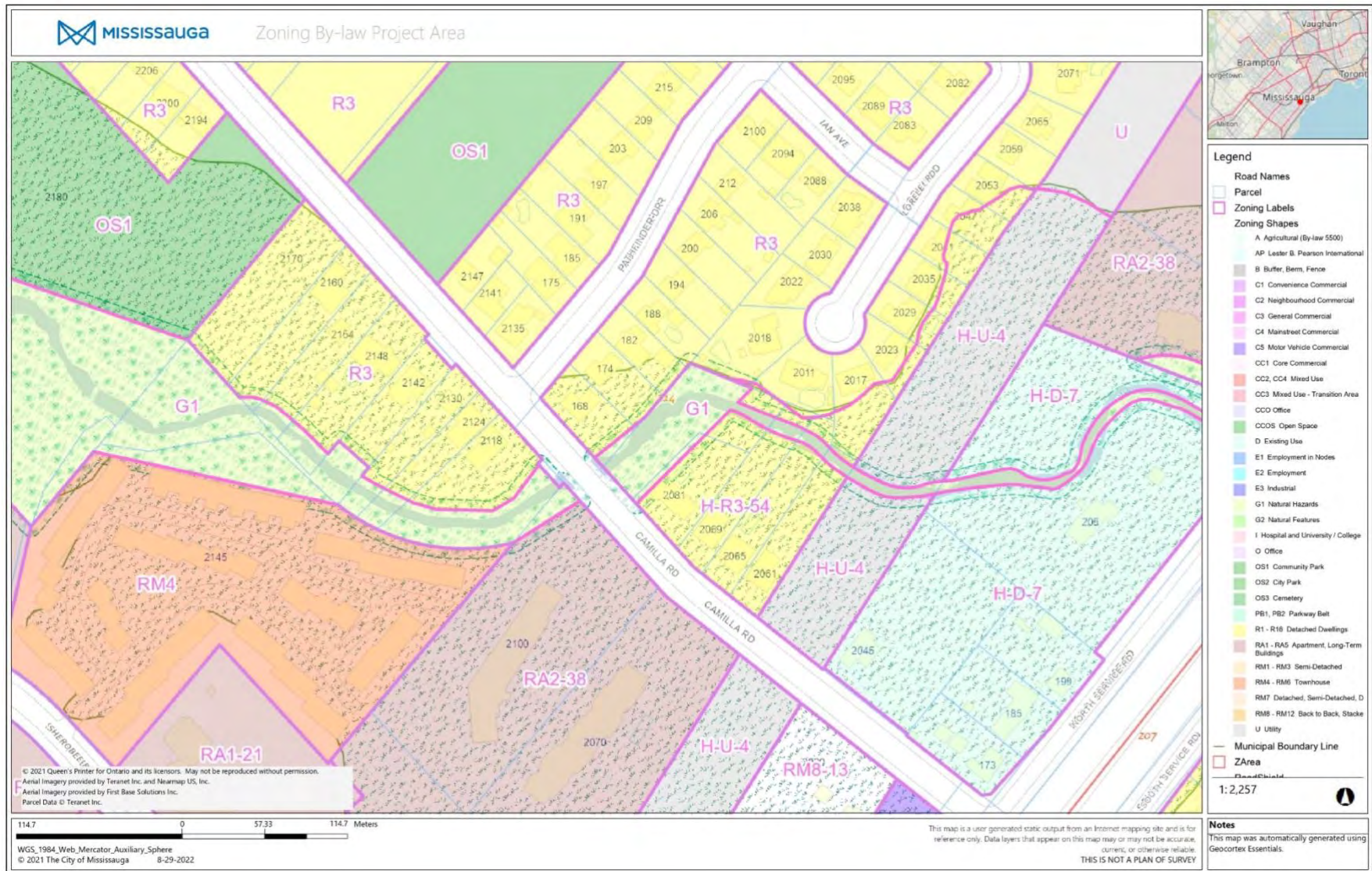


Figure 11. Zoning Map of the Study Area (City of Mississauga Interactive Mapping, 2021)

4.5.1 Archaeological Resources

A Stage 1 Archaeological Assessment was completed for the Study Area by Archaeological Services Inc. (ASI) in November 2021. Results of the investigation concluded that a small part of the Study Area east of Camilla Road retains archaeological potential and required completion of a Stage 2 investigation to confirm no archaeological resources exist. A copy of the Stage 1 Archaeological Assessment is provided in Appendix B.

Given these findings, a Stage 2 Archaeological Assessment was completed by ASI on June 6, 2022, in accordance with the *Ontario Heritage Act* (Ontario Heritage Act, R.S.O. c. O.18, 1990, as amended in 2021) and the 2011 "Standards and Guidelines for Consultant Archaeologists". A small portion of the Study Area east of Camilla Road, as shown in Figure 12 below, was subject to test pit survey at 10 m intervals to confirm previous disturbance and gleysolic soil conditions. No archaeological resources were encountered during the Stage 2 survey, and no further archaeological assessment was recommended. A copy of the Stage 2 Assessment is provided in Appendix B.



Figure 12. Stage 2 Archaeological Assessment Study Area

4.5.2 Cultural Heritage Resources

The Ontario Ministry of Citizenship and Multiculturalism (MCM) mandates the conservation of **Ontario's cultural heritage, which includes archaeological resources, cultural heritage landscapes, and built heritage resources.** Based on review of federal registers and municipal and provincial heritage inventories, 2130 Camilla Road is a heritage listed property in the vicinity of the project. It was determined that there is a very low potential for impact on the heritage home as no work

is proposed within the immediate proximity of the home. Twenty-eight (28) cultural heritage landscapes have been identified within the City of Mississauga. However, based on review of the **City of Mississauga’s Cultural Heritage Landscape Project entitled “Conserving Heritage Landscapes” (Volumes 1-3, January 2022)**, there are no Cultural Heritage Landscapes within the Study Area. Further, based on the Mississauga Official Plan (2021), Schedule 10 – Land Use Designations, there are no Heritage Conservation Districts within the Study Area. Therefore, it was determined that a Cultural Heritage Evaluation Report was not required as part of this study.

4.6 Existing Utilities and Services

In addition to public notices (see Section 9.1 below), requests were made to Ontario One Call for information regarding existing utilities located below Camilla Road within the Study Area. The locates identified a buried Bell cable and an Enbridge gas main west of Camilla Road and a 1200-millimetre (mm) diameter sanitary main, and 150 mm diameter watermain underneath Camilla Road. All correspondence and locate information made available has been provided in Appendix D.

As-builts of the existing services below Camilla Road have been provided to the Project Team by the City. According to the 1982 City of Mississauga drawings Plan No. C-19960, a 1200 mm diameter storm sewer west of the Camilla Road bridge, 600 mm diameter storm sewer east of the Camilla Road bridge, and 1200 mm diameter sanitary sewer (confirmed by Ontario One Call) are located within the Study Area on Camilla Road. Further investigation into the existing utilities located within the Study Area is recommended during the detailed design stage of the project.

There is a Hydro One corridor running in a general east-west direction just south of the Study Area; however, it is located outside of the Study Area.

4.7 Hydrology and Hydraulics

The hydrology and hydraulic model for Cooksville Creek was provided by CVC.

4.7.1 Hydrologic Modelling

Hydrological modeling of Cooksville Creek was completed by CVC. The HEC-RAS model (2020) includes existing and future return period events as summarized in Table 1 and Table 2, where river station (RS) 13656 is located upstream of the Study Area and RS 13382 is located within the Study Area. The future hydrology reflects the future land use and infrastructure projects in the Cooksville Creek watershed to reduce flood flows. The CVC standard model parameters are included in Appendix C.

Table 1. Existing Return Period Flows within the Study Area

Reach	RS	2-year (m ³ /s)	5-year (m ³ /s)	10-year (m ³ /s)	25-year (m ³ /s)	50-year (m ³ /s)	100-year (m ³ /s)	Regional (m ³ /s)
2211	13656	70.4	102.6	134.2	160.6	184.8	211.5	268.2
2211	13382	70.3	102.5	134.1	161	185.7	212.8	272.9

Table 2. Future Return Period Flows within the Study Area

Reach	RS	2-year (m ³ /s)	5-year (m ³ /s)	10-year (m ³ /s)	25-year (m ³ /s)	50-year (m ³ /s)	100-year (m ³ /s)	Regional (m ³ /s)
2211	13656	64.3	96.2	125.5	148.9	171.4	195	271.7
2211	13382	64.3	96	125.8	149.6	172.6	196.7	276.4

4.7.2 Existing Hydraulic Modelling

Hydraulic modelling and floodplain mapping of the Cooksville Creek watershed was developed by CVC in 2020. The model was created using HEC-RAS Version 5.0.7 modelling software. Cross-section geometry of the channel was determined using 2015 LiDAR topographic data, with all cross-sections being cut from left to right, looking downstream. The Flood Hazard Map, prepared by CVC, was generated by inputting peak flows in the HEC-RAS model from the hydrology model.

The HEC-RAS cross sections within the study area are shown in

Figure 13 below. Topographic survey data, collected by Resilient Consulting in November 2021, was used to update RS 13382, 13307 and 13253 in the study area. The water surface elevation (WSE) results from **CVC’s existing future flow model and Resilient’s updated existing future flow model** are shown in Table 3. A copy of the Hydraulic Memo and model outputs can be found in Appendix C.

Table 3. Existing water surface elevations

Section #	CVC Future Flows Model		Resilient Future Flows Model		Difference: Resilient – CVC	
	100 Year W.S.E. (m)	Regional W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13445 (U)	99.86	100.19	99.78	100.19	-0.08	0
13382	99.91	99.98	99.83	99.91	-0.08	-0.07
13329	99.92	99.99	99.84	99.94	-0.08	-0.05
13307	99.7	99.97	99.56	99.91	-0.14	-0.06
13253	99.44	99.83	99.56	99.91	0.12	0.08
13189 (D)	99.47	99.81	99.46	99.79	-0.01	-0.02
13143 (D)	99.47	99.81	99.46	99.8	-0.01	-0.01
13135 (D)	99.46	99.8	99.44	99.79	-0.02	-0.01
13104 (D)	99.46	99.8	99.44	99.79	-0.02	-0.01

U = located upstream of site

D = located downstream of site

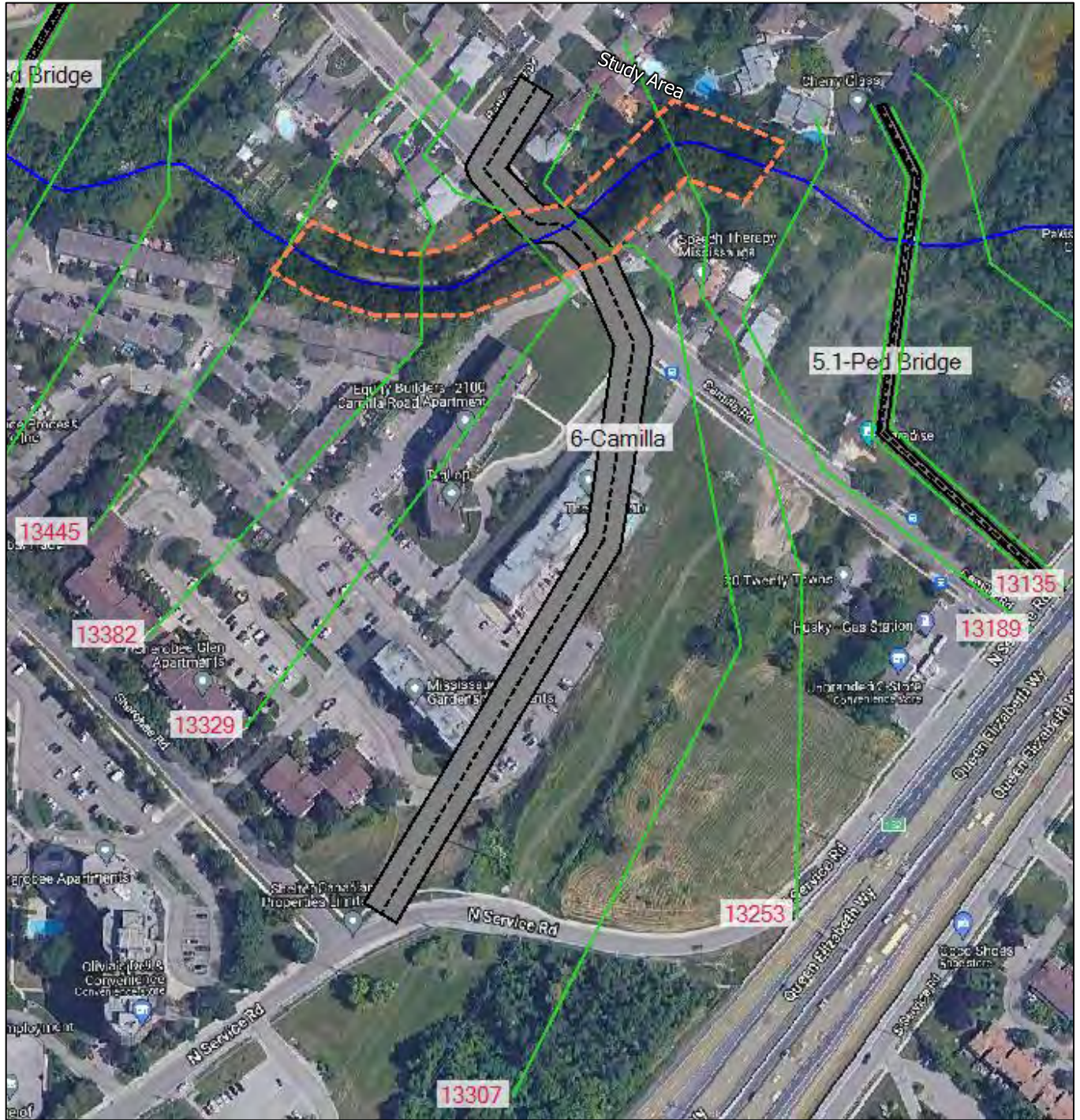


Figure 13. HEC-RAS cross sections within study area

4.7.3 Proposed Hydraulic Modelling

To assess the impact of the proposed restoration design on water surface elevations experienced in the Cooksville Creek, the existing HEC-RAS model cross sections passing through the site (River Station (RS) 13382, 13307 and 13253) were updated to reflect the new channel geometry. The HEC-RAS cross sections within the study area are shown in

Figure 13 in above. It is noted that no WSE increases greater than 1 cm are experienced during the 2-100 year and Regional events.

The water surface elevation (WSE) results from Resilient’s existing future flow model and Resilient’s proposed future flow model are shown in Table 4. A copy of the Hydraulic Memo and model outputs can be found in Appendix C.

Table 4. Existing water surface elevations

Section #	Resilient Proposed		Resilient Existing		Difference: Resilient Proposed – Resilient Existing	
	100 Year W.S.E. (m)	Regional W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13445 (U)	99.7	100.19	99.78	100.19	-0.08	0
13382	99.8	99.81	99.83	99.91	-0.03	-0.1
13329	99.83	99.91	99.84	99.94	-0.01	-0.03
13307	99.54	99.88	99.56	99.91	-0.02	-0.03
13253	99.52	99.87	99.56	99.91	-0.04	-0.04
13189 (D)	99.46	99.79	99.46	99.79	0	0
13143 (D)	99.46	99.8	99.46	99.8	0	0
13135 (D)	99.45	99.79	99.44	99.79	0.01	0
13104 (D)	99.44	99.79	99.44	99.79	0	0

U = located upstream of site

D = located downstream of site

5 Identification of Alternative Solutions

The Municipal Class EA process recognizes that there are different ways of solving a particular problem and requires that various alternative solutions be considered. To address the identified problem and opportunity defined in Section 3, a range of alternative solutions were developed for erosion control in the Study Area. The four (4) alternatives identified for evaluation included:

- Alternative 1- Do Nothing
- Alternative 2- Local Improvements
- Alternative 3- Reach Scale Improvements
- Alternative 4- Natural Channel Restoration

The sub-sections below provide further details regarding each alternative. Conceptual drawings of each alternative are shown as part of the Public Information Centre (PIC) materials provided in Appendix D and Figure 14 to Figure 17 below.

5.1 Alternative 1 – ‘Do Nothing’

As required by the Municipal Class EA planning process, a ‘Do Nothing’ alternative was included to provide a benchmark to evaluate the other alternatives against. The ‘Do Nothing’ alternative would involve leaving the Study Area in its current condition, as shown in Figure 14. As a result, the existing Gabion baskets, interlocking wall and concrete channel will continue to deteriorate, leading to an increase in local erosion and risk to property and infrastructure.

5.2 Alternative 2 – Local Improvements

Alternative 2 includes local improvements or **“spot treatments” along the channel at strategic** locations to limit the impact of erosion, as shown in Figure 15. This alternative involves filling or repairing cracks and scours in the existing concrete, replacing the failed Gabion walls and bank protection with new erosion protection, and replacing the leaning interlocking wall with a new stone wall or vegetated slope.

There would be no change to the alignment of the channel. The Camilla Road bridge would also remain as it is currently, as would the existing concrete wall east of Camilla Road.

This alternative maintains the existing channel footprint within the Study Area and addresses the critical failing infrastructure in the short-term. However, it does not provide for naturalization of the channel and therefore, provides minimal environmental benefit. The cost of implementing Alternative 2 is low in comparison to Alternatives 3 and 4, but continued maintenance costs would be required.

5.3 Alternative 3 – Reach Scale Improvements

As a part of Alternative 3, the **“spot treatments”** would extend to the existing top of bank and maintain the existing channel alignment. As shown in Figure 16, this alternative involves replacing the existing concrete channel with an armourstone-lined channel west of Camilla Road, and replacing the failed Gabion walls with a new stone wall and replacing the leaning interlocking wall and Gabion bank protection with a vegetated slope, east of Camilla Road.

The Camilla Road bridge would also remain as it is currently, as would the existing concrete wall east of Camilla Road.

This alternative nearly maintains the existing channel footprint within the Study Area, provides protection for nearby properties from deteriorating banks, and provides environmental and aesthetic benefits through the cleanup and naturalization of the channel. The cost of implementing Alternative 3 is moderate in comparison to Alternatives 2 and 4.

5.4 Alternative 4 – Natural Channel Restoration

This alternative consists of restoring the channel within the Study Area based upon the principles of natural channel design. Alternative 4 would involve expanding the channel on both sides of Camilla Road to extend the full width of the City's easements to incorporate the channel meander and bank protection, as shown in Figure 17. However, the channel profile/cross-sections, engineered details, and channel realignment footprint would be determined during the detailed design phase of the project.

The Camilla Road bridge would also remain as it is currently, as would the existing concrete wall east of Camilla Road.

This alternative provides for full restoration of the channel to its **"natural" structure and function**, and would provide long-term sustainability of its banks and resilience to major flood events/erosion. However, construction would be long and disruptive, and there would be an increase to the existing channel footprint within the Study Area, leading to the loss of private property. Also, the cost of implementing Alternative 4 is the highest of all alternatives.

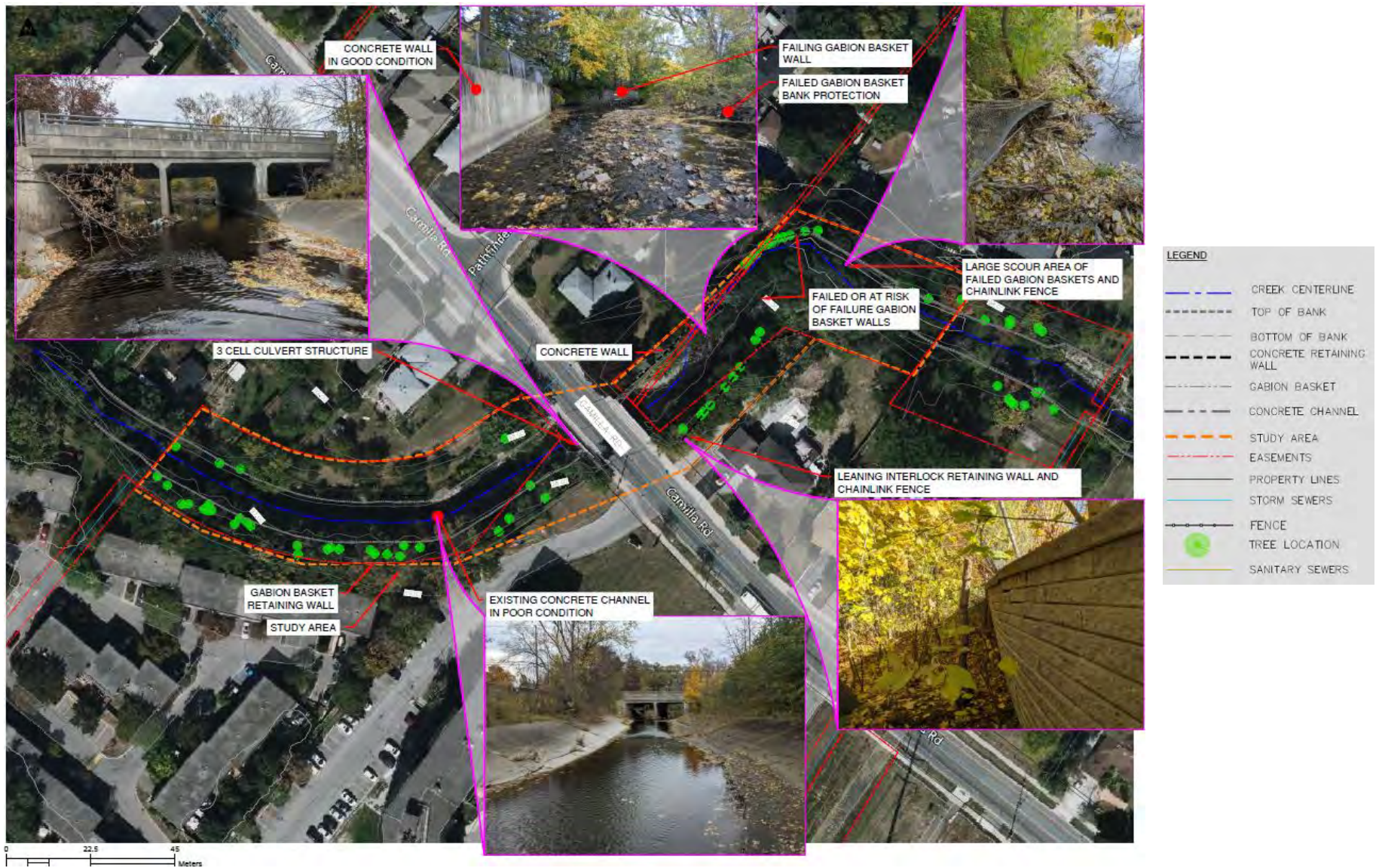


Figure 14. Alternative 1- 'Do Nothing'

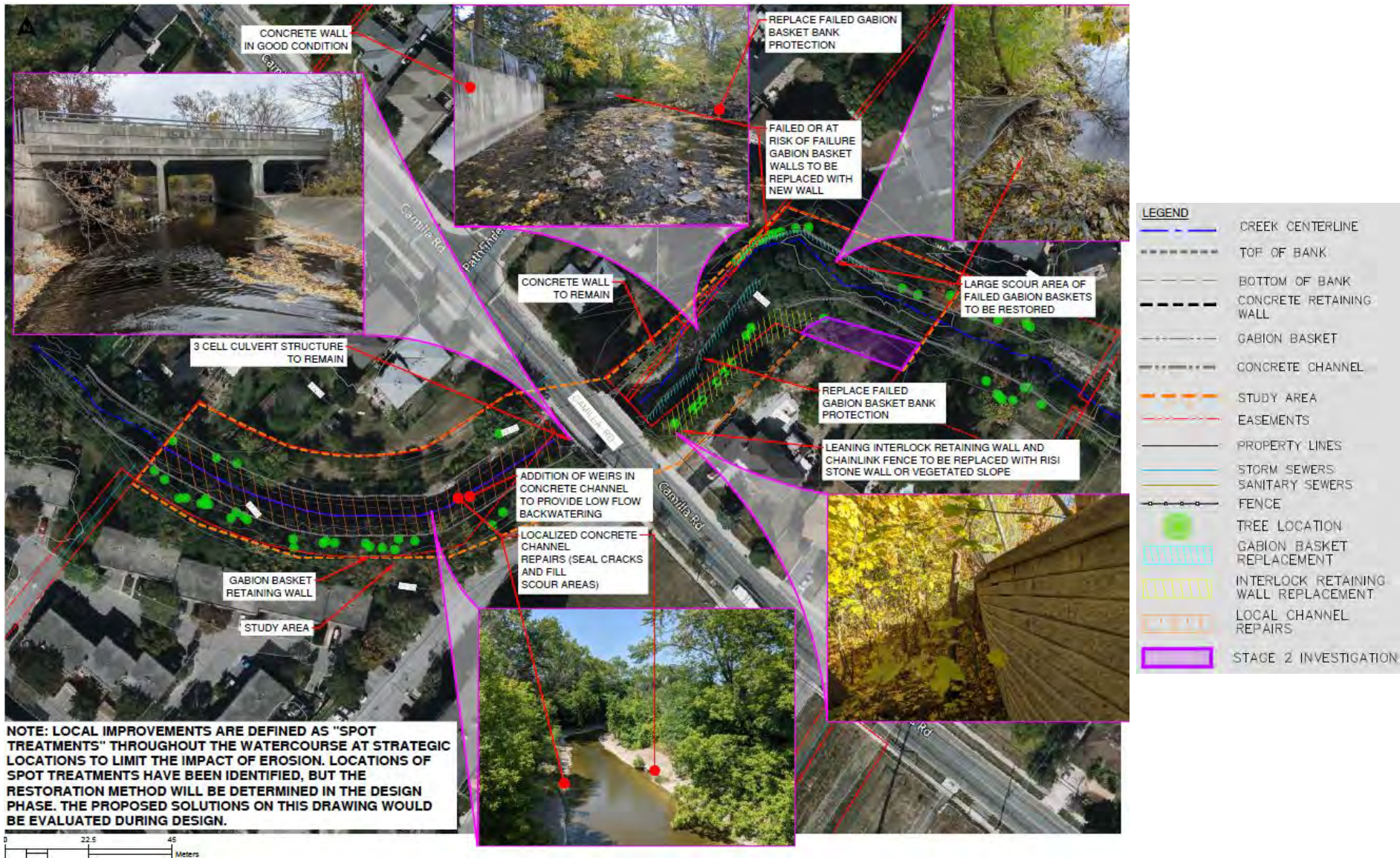


Figure 15. Alternative 2- Local Improvements

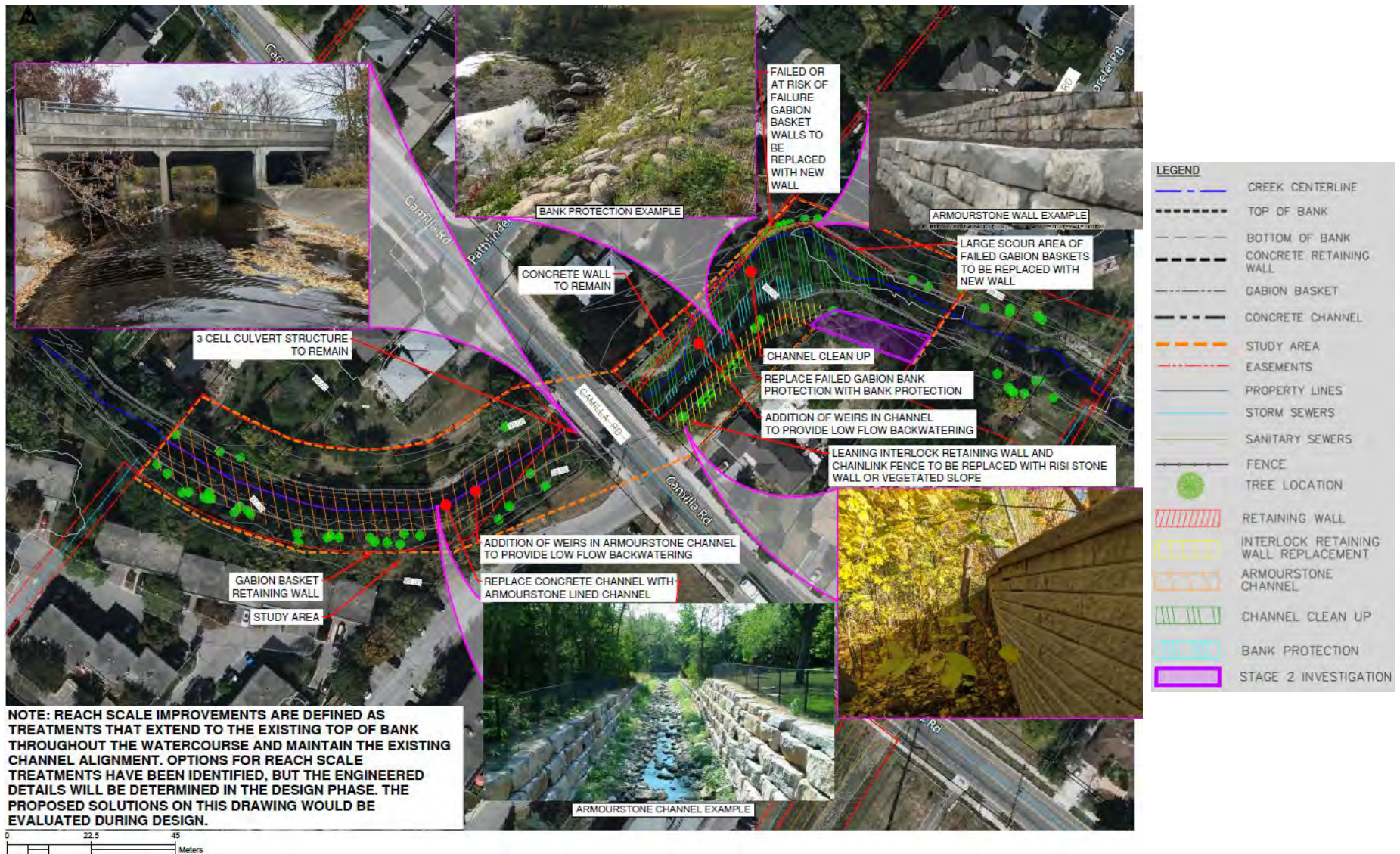


Figure 16. Alternative 3- Reach Scale Improvements

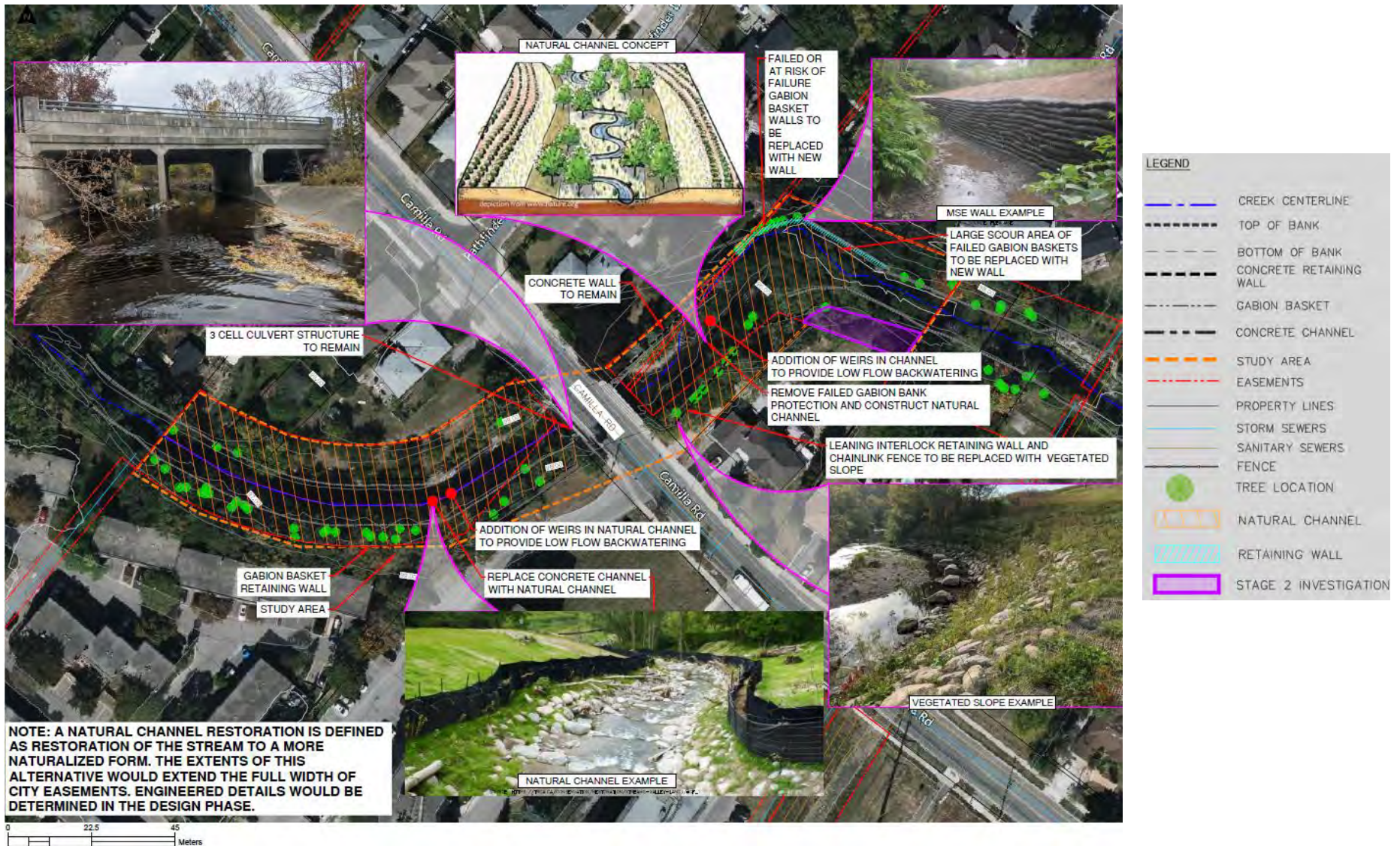


Figure 17. Alternative 4- Natural Channel Restoration

6 Evaluation of Alternatives

Taking the previously described existing environment into consideration, the four (4) alternatives described above were comparatively evaluated to consider the suitability of each potential solution. The sub-sections below provide further details regarding the evaluation methodology, the comparative evaluation itself, and how the preliminary recommended solution was confirmed as the preferred solution.

6.1 Evaluation Methodology

The evaluation used a descriptive or qualitative assessment based on evaluation criteria that were developed specific to this project and take into consideration the definition of the “environment” as defined under the *Environmental Assessment Act* (see Section 2.1 above). Evaluation criteria were divided into the following categories, as listed in Table 5 below.

Table 5. Evaluation Criteria

Evaluation Category	Evaluation Criteria
Technical/Engineering	Ability to Maintain Hydraulic Capacity (Convey Water)
	Erosion Mitigation
	Constructability
	Site Access
Natural Environment	Aquatic Habitat Impact/ Opportunities
	Terrestrial Habitat Impact/ Opportunities
	Sensitive Species Impact/ Opportunities
	Water Quality
Social/Cultural Environment	Archaeological and Cultural Heritage Resources Impact/ Opportunities
	Adjacent Property Impact/ Opportunities
	Indigenous Community Impact
	Temporary Traffic, Noise, Dust Impacts During Construction
	Aesthetics
Economic	Capital Costs
	Operation and Maintenance Costs

The evaluation criteria reflect all components of the technical, natural, social, and cultural environment, as well as the estimated costs, as required by the *Environmental Assessment Act*. Each element of the evaluation assessed the impacts in terms of the potential changes from existing conditions, in addition to opportunities for improvement.

To evaluate each alternative, each of the evaluation criteria presented above were assessed in a descriptive manner. A numerical or weighted ranking system was not used. Instead, the evaluation focused on the strengths and weaknesses of each alternative to identify the best possible solution. While set weightings for each criterion were not specifically assigned, all evaluation criteria are not necessarily equal, and professional judgement and knowledge of the area and issues were used to determine preferences.

Using this **assessment, each alternative was ranked as 'more preferred'** (green), **'moderately preferred'** (yellow), or **'least preferred'** (red), as depicted by the colours illustrated in Table 6 below. Upon completion of the evaluation, the alternative with the most criteria identified as 'more preferred' was selected as the preliminary preferred solution, depending on the relative advantages and disadvantages of each environmental effect and whether they could be mitigated.

6.2 Comparative Evaluation

The comparative evaluation of alternative solutions is provided in Table 6 below.

Table 6. Comparative Evaluation of Alternative Solutions

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Technical/Engineering				
Ability to Maintain Hydraulic Capacity (Convey Water)	Hydraulic performance will continue to decline due to failure of Gabion banks (stones and chain-link fence framing) and walls and on-going degradation of concrete channel. Existing debris and sediment to continue to accumulate, further obstructing flow within the channel.	Moderate improvement of hydraulic capacity within channel where failing Gabion baskets and leaning interlocking wall obstructs flows. Debris and sediment will continue to create some reduction of hydraulic capacity. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.	Increase in hydraulic performance due to channel restoration/naturalization and debris removal. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.	Full restoration of hydraulic function within stream channel up to top of bank. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.
Erosion Mitigation	Existing Gabion baskets, interlocking wall, and concrete channel will continue to deteriorate, resulting in further erosion of channel banks and sediment release into the watercourse.	Removal of most imminent erosion risks. Potential for continued erosion and scour of concrete channel.	Removal of erosion risks. Long-term stability provided.	Removal of erosion risks. Long-term stability provided.
Constructability	No construction required.	Construction repairs would be completed with relatively small machinery and minor flow diversion would be required. Shortest construction duration.	Construction would require large equipment access and a flow diversion plan. Replacement of concrete channel with an armourstone lined channel would require extensive demolition and material handling. Moderate construction duration.	Most complex and intrusive works required to replace concrete channel with natural channel and interlocking retaining walls with vegetated slope. Longest construction duration.
Site Access	No site access required.	Site would be accessed through City owned property and easements.	Site would be accessed through City owned property and easements.	Site would be accessed through City owned property and easements. May require access through private properties to access top of bank areas outside of City easements.
Natural Environment				
Aquatic Habitat Opportunities	No improvements.	Removal of the failed Gabion baskets which have fallen into the channel would result in a minor improvement to fish habitat and fish passage.	Removal of debris and sedimentation from the channel would result in a moderate improvement to fish habitat and fish passage. Removal and replacement of the concrete bed west of Camilla Road with a natural substrate would result in a moderate improvement to aquatic habitat. Installation of weirs will also improve aquatic habitat.	Natural channel design would result in the greatest improvement to aquatic habitat. Meanders would increase the total length of aquatic habitat, reduce flow velocity, and mitigate ongoing erosion. A natural substrate would create habitat for a variety of aquatic species and provide features and functions such as rest stops for fish, fish spawning areas, fish foraging areas, and habitat for aquatic invertebrates.
Aquatic Habitat Impact	No in-water or near-water works required.	Some in-water and near-water works required. Disturbance can be mitigated.	In-water and near-water works required, more than Alternative #2 but less than Alternative #4. Disturbance can be mitigated.	In-water and near-water works required (more than Alternative #3). Disturbance can be mitigated.
Terrestrial Habitat Opportunities	No improvements. No removal of terrestrial invasive species.	No improvements. No removal of terrestrial invasive species.	Replacing a portion of the Gabion baskets with a natural form of bank protection would result in a minor increase in terrestrial habitat. Replacement of the concrete channel with an armourstone lined channel would also provide an increase to habitat.	Vegetation clearing would result in invasive species removal. Restoration would involve native tree plantings and seedings, which would result in improved species diversity and habitat use. A naturalized channel provides the highest benefit to terrestrial and aquatic wildlife.

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Terrestrial Habitat Impact	No tree removals or other vegetation removals required.	Some tree and other vegetation removals anticipated to be required.	Tree and other vegetation removals anticipated to be required, more than Alternative #2. Replacement of sloped concrete banks with armourstone west of Camilla Road may be a barrier to terrestrial wildlife accessing the creek and aquatic wildlife accessing terrestrial habitat (e.g., turtles accessing potential nesting sites).	Tree and other vegetation removals anticipated to be required, more than Alternative #3. Long-term improvements outweigh short-term impacts.
Sensitive Species Opportunities	No improvements.	Minor improvements for aquatic species (e.g., fish, turtles).	Moderate improvements for aquatic species (e.g., fish, turtles). Removal of partial terrestrial invasive species and installation of native plantings and seedings will improve habitat for terrestrial species (e.g., plants, birds, insects).	Highest level of improvements for aquatic species (e.g., fish, turtles) by creating suitable habitat. Removal of terrestrial invasive species and installation of native plantings and seedings will improve habitat for terrestrial species (e.g., plants, birds, insects).
Sensitive Species Impact	No impacts.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.
Water Quality	Further accumulation of debris and sediment in the channel leading to a reduction of water quality over time.	Removal of failed gabion baskets that have fallen into the channel would eliminate locations where debris and sediment accumulate, resulting in a minor improvement to water quality.	Removal of debris and sedimentation from the channel would result in a moderate improvement to water quality.	Natural channel design and restoration plantings and seedings would result in the greatest improvement to water quality. Restoration plantings and seedings will control overland runoff and regulate water temperature. In-channel plants trap sediment and filter pollutants.
Social/Cultural Environment				
Archaeological and Cultural Heritage Resources Impact/Opportunities	No potential impact to cultural heritage resources or potential archaeological resources. No impact on heritage property.	No potential impact to cultural heritage resources as confirmed through Stage 2 Archaeological Assessment. Very low potential for impact on heritage property.	No potential impact to cultural heritage resources as confirmed through Stage 2 Archaeological Assessment. Very low potential for impact on heritage property.	No potential impact to cultural heritage resources as confirmed through Stage 2 Archaeological Assessment. Very low potential for impact on heritage property.
Adjacent Property Impact/Opportunities	Risk of further channel deterioration could result in private property loss.	No loss to adjacent properties. Long-term stability of private property may not be provided as the solution is only for "spot treatments."	No loss to adjacent properties. Long-term erosion protection provided.	Loss of private property/table land within City easements, although long-term erosion protection provided.
Indigenous Community Impact	No potential impacts to Indigenous communities, rights, and interests.	Low potential for impacts to Indigenous communities, rights, and interests.	Low potential for impacts to Indigenous communities, rights, and interests.	Low potential for impacts to Indigenous communities, rights, and interests.
Temporary Traffic, Noise, Dust Impacts During Construction	No temporary nuisances or impacts due to no construction.	Possible minor traffic disturbances along Camilla Road to facilitate limited material transport and truck loading. Possible noise/dust impacts can be mitigated. Shortest construction duration.	Possible traffic disturbances along Camilla Road to facilitate material transport and truck loading. Possible noise/dust impacts can be mitigated. Moderate construction duration.	Traffic disturbances along Camilla Road to facilitate material transport and truck loading. Possible noise/dust impacts can be mitigated. Longest construction duration and associated nuisances.

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Aesthetics	Appearance of channel will continue to decline due to deterioration of channel infrastructure and further accumulation of debris and sediment.	Minor upgrade to channel appearance in areas with observable structure deterioration.	Channel west of Camilla Road would be greatly improved due to replacement of deteriorating concrete channel with armourstone and a naturalized bottom. Channel naturalization east of Camilla Road would have significant value-added components due to revegetation and habitat creation. Would provide consistency with the watercourse both up and downstream of the site.	Channel on either side of Camilla Road would be greatly improved due to naturalization of deteriorating existing channel. However, a fully naturalized channel could look out of place and would not blend with the watercourse both up and downstream of the site.
Economic				
Capital Costs	No capital costs.	Low capital costs. Interlocking wall and weir installation would require increased equipment and staging costs. Lowest Cost	Moderate capital costs. Concrete channel replacement would require significant materials and disposal costs. Moderate Cost	High capital costs. Restoration would require significant equipment, materials, and disposal costs. Highest Cost
Operation and Maintenance Costs	High costs for future repair of failing structures and possible loss of infrastructure / property damage.	Moderate costs for ongoing monitoring and maintenance of repaired infrastructure. Ongoing concrete patching and Gabion basket repairs would be required as structures undergo erosion forces. Considered a short-term solution.	Low costs for on-going monitoring and maintenance of replaced infrastructure. Some temporary erosion controls required until vegetation is fully established. Considered a long-term solution.	Lowest costs for on-going monitoring and maintenance of replaced infrastructure. Some temporary erosion controls required until vegetation is fully established. Considered a long-term solution.
SUMMARY				
	Failing channel structures will continue to degrade over time and increase local erosion and risk to property and infrastructure. No environmental benefit is provided.	Critical failing infrastructure would be addressed in the short-term. Minimal disturbance and costs associated with "spot treatments" . However, does not achieve naturalization of channel and provides minimal environmental benefit.	Replacement of failing infrastructure would provide protection for nearby properties from deteriorating banks. Cleanup and naturalization of channel would provide environmental and aesthetic benefits.	Full restoration of channel to "natural" structure and function would provide long-term sustainability of banks and resilience to major flood events/erosion. However, construction would be long and very disruptive and private property would be lost. Results would not "match" watercourse conditions both up and downstream.
	Least Preferred	Moderately Preferred	Most Preferred	Moderately Preferred

	More Preferred
	Moderately Preferred
	Least Preferred

6.3 Identification of Recommended Solution

Based on the comparative evaluation, the most preferred alternative is Alternative 3 – Reach Scale Improvements, as shown in Figure 16. Alternative 3 proposes to address the Problem Statement by implementing treatments that will extend to the existing top of bank and maintain the existing channel alignment. This approach focuses on restoring the channel reach within the Study Area, while nearly maintaining the existing footprint and minimizing site disturbance when compared to ‘Alternative 4 – Natural Channel Restoration’. This allows long-term erosion protection, no loss to adjacent properties, and preservation of natural features, where possible. Alternative 3 will include the following:

- Removal of failed Gabion basket wall and replacement with armourstone wall;
- Removal of the Gabion bank protection and leaning interlocking wall and replacement with vegetated rock buttress;
- Removal of the existing concrete channel and replacement with armourstone-lined channel (see Section 6.3.1 below for design modification);
- Installation of armourstone toe protection at the existing concrete wall;
- Removal of debris and channel cleanup within the Study Area that may be detrimental to flow conveyance capacity; and
- Installation of armourstone weirs in the channel to provide low flow backwater effects.

The selected alternative best satisfies the Problem or Opportunity Statement and provides the best long-term solution for the City of Mississauga. Key features of this alternative include:

- Provides a moderately natural and ‘green’ solution;
- Minimizes disturbance area and vegetation removal;
- Reduces erosion risks;
- Promotes removal of debris in the channel;
- No loss to private property table land;
- Improves fish habitat and passage through the watercourse;
- Moderate capital costs and low future maintenance costs; and
- Blends with existing erosion protection surrounding the site.

Alternative 3 – Reach Scale Improvements was brought forward as the recommended solution for stakeholder review and comment as part of the online PIC. As a result, a preference was expressed for the recommended solution by some neighbouring residents. Ultimately, Alternative 3 was confirmed as the preferred solution. Further details regarding stakeholder communications and consultation are provided in Section 9 below.

6.3.1 Preferred Design Modification

Following the online PIC in April 2022, Resilient conducted a detailed hydraulic analysis of the preferred alternative. Based on the findings of this analysis, it has been determined that a modification to the initial design is warranted. Instead of the previously proposed replacement of the entire concrete channel with an armourstone-lined channel, it has been determined that approximately 28 m of the existing concrete channel, immediately upstream (west) of the Camilla Road bridge will be retained and repaired to serve as a hydraulic apron (i.e., foundation), facilitating water flow under the bridge. This modification aligns with the project's goals while

ensuring the most effective and efficient solution for environmental and engineering objectives. Additionally, it should be noted that immediately upstream of the Camilla Road bridge, along the south bank, approximately 22 m of the existing concrete channel cannot be repaired until a private property access agreement is obtained. These modifications are shown in Figure 18 below.

7 Preferred Solution

As detailed above and shown in Figure 18 was identified as the preferred solution for erosion control within the Study Area. The following sections describe the proposed works and considerations recommended to implement the preferred solution.

7.1 Conceptual Design Considerations

7.1.1 Site Preparation and Existing Channel Reconstruction

Prior to commencing removal of the existing Gabion baskets and concrete channel liner, a comprehensive Erosion and Sediment Control Plan, to be developed during detailed design, must be implemented on site. It is anticipated that the Plan will focus on isolation of the work area from the incoming channel flow and will prohibit sediment runoff downstream. Flow bypass around the work area, consisting of a dam and pump-type system, should be implemented to ensure the proposed work can be completed in dry conditions. The requirement for an Environmental Activity and Sector Registry or for a Permit to Take Water from the MECP for water takings greater than 50,000 litres per day is not anticipated, nor are any impacts to groundwater. Permits to Take Water are not required for passive and/or active in-stream diversions for construction purposes.

The removal of the existing Gabion baskets, concrete channel liner and debris can be done primarily with a small excavator. Where possible, Gabion units should be removed fully intact. All wire cages and stone used to fill these cages are to be removed and disposed of offsite. Further discussion regarding the disposal of Gabion materials should take place during detailed design.

7.1.2 Concrete Channel Immediately West of Camilla Road

Approximately 28 m of the existing concrete channel, immediately upstream of the bridge on the north and south banks, will be retained to serve as a hydraulic apron, facilitating water flow under the bridge. This stretch of the concrete channel will undergo necessary repairs to address cracks and scours in the existing concrete. However, approximately 22 m of the existing concrete channel along the south bank cannot undergo repairs until a private property access agreement is obtained.

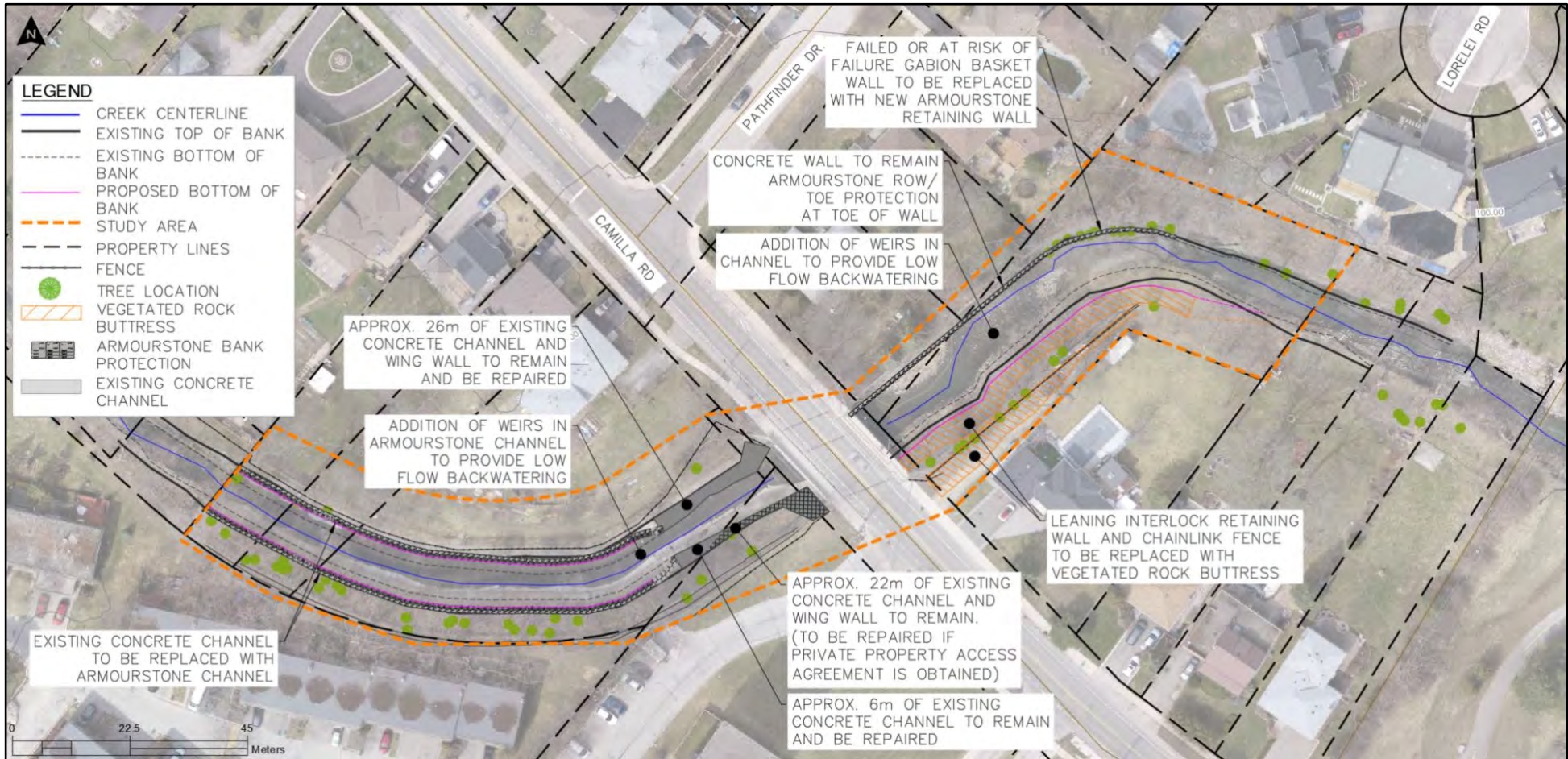


Figure 18. Preferred Solution: Alternative 3- Reach Scale Improvements with Concrete Channel Design Modifications

7.1.3 Armourstone Channel 28 m West of Camilla Road

Once the existing concrete channel liner is removed, approximately 28 m west of Camilla Road, excavation to revise the geometry of the existing channel can commence. The proposed preliminary design, west of Camilla Road, consists of three (3) rows of armourstones stacked and offset along both banks to create a 1:1 slope. All vertical joints should be tight fitted to minimize gaps. The armourstone channel should tie into the existing top of bank and match the elevation of the channel bed while maintaining the existing channel alignment. The bottom width of the channel will be widened by approximately 3.1 m. Excess fill material generated from excavation of the banks is to be characterized and **re-used or disposed of in accordance with Ontario's On-Site and Excess Soil Management Regulation (Ontario Regulation 406/19)**.

Prior to placement of the armourstone, a filter layer, consisting of bedding stone or geotextile, should be installed against the existing backfill material. This filter layer will ensure fine material located under or behind the armourstone is not washed out through the large voids between the stones. As the wall is currently proposed to be greater than 1 m high, the design of the wall is to be sealed by a Structural Engineer.

7.1.4 Armourstone Toe Protection Immediately East of Camilla Road (North Bank)

East of Camilla Road, along the north bank, the existing 48 m concrete wall is not to be removed. One row of armourstone toe protection is proposed along the whole length of the existing concrete wall to provide stabilization.

7.1.5 Armourstone Wall 48 m East of Camilla Road (North Bank)

Approximately 48 m east of Camilla Road, along the north bank, the failed Gabion wall is to be replaced with an armourstone wall to the top of the existing bank height. The armourstone wall would tie into the existing concrete wall to the left and would have the same footprint as the existing Gabion wall. The design will be based on a geotechnical assessment and will be sealed by a Structural or Geotechnical Engineer.

Prior to placement of the armourstone, a filter layer, consisting of bedding stone or geotextile, should be installed against the existing backfill material. This filter layer will ensure fine material located under or behind the armourstone is not washed out through the large voids between the stones. Armourstone is to be stacked along the banks to achieve the required design height. All vertical joints should be tight fitted to minimize gaps.

7.1.6 Vegetated Rock Buttress East of Camilla Road (South Bank)

East of Camilla Road, along the south bank, the failed Gabion bank protection and leaning interlocking wall are to be fully replaced with vegetated rock buttress at a 3:1 slope which will require regrading of the existing bank. Native vegetation will be planted throughout the revetment and stone sizes would be designed to withstand watercourse flow velocities to protect the slope against further erosion. The plants to be used for revegetation and their sizes will be determined during detailed design. Excess fill material generated from excavation of the banks is to be characterized and **re-used or disposed of in accordance with Ontario's On-Site and Excess Soil Management Regulation (Ontario Regulation 406/19)**. An example of a vegetated rock buttress design by Resilient is shown in Figure 19 below.



Figure 19. Vegetated Rock Butress

7.1.7 Armourstone Weirs

A series of armourstone weirs will be installed in the channel to create low flow backwater effects upstream of the weir which will provide erosion control and habitat benefits. The placement, spacing, grades and stone sizes will be determined during detailed design. Examples of armourstone weirs are shown in Figure 20 below.



Figure 20. Armourstone Weirs

7.1.8 Riparian Buffers and Fencing

The opportunity to create riparian buffers along the channel for filtering sediment and pollutants should also be considered as part of the Restoration Plan to be completed during detailed design.

The need for fencing along the channel for public safety purposes will be determined by the City of Mississauga.

7.2 Climate Change Considerations

Climate change resiliency and adaptation is now considered an integral part of the design and upgrade of municipal infrastructure. Changing rainfall patterns and more extreme storm events have increased the risk of flooding and damage to both public and private properties. The proposed upgrades to the creek provide an opportunity to improve the existing hydraulic capacity of the channel, resulting in a reduction of flood risks to the properties that neighbour the channel. The proposed upgrade alternatives have been sized to fully convey the 100-year storm event (i.e., a storm that has a 1 percent chance of occurring during any given year), in addition to providing some additional capacity for more extreme events that can be attributed to climate change.

With the exception of temporary greenhouse gas emissions from construction equipment, the project will not increase greenhouse gases. Rather, the naturalized channel will serve as a small carbon sink. The design of the channel will be confirmed during detailed design.

7.3 Construction Nuisances

Full road closures are not anticipated, however temporary partial lane closures at Camilla Road may be required. In addition, temporary construction nuisance effects may include dust, noise, and vibrations. The severity of impact will depend on various factors such as time of operation, size of equipment, and soil conditions. Although these details will not be determined until detailed design, recommended mitigation measures to minimize the annoyance potential are provided in Section 8 below.

7.4 Construction Schedule and Timing

Subject to Class EA clearance and budget approval, detailed design is tentatively planned for 2024, with construction planned to start in 2025. While efforts will be made to complete the entire construction within one construction season, it may be completed in phases considering construction access to the creek. The following potential access phasing plan is anticipated:

- Access for Phase 1: Removal of concrete liner and installation of armourstone lined channel along both banks, 28 m west of Camilla Road. Installation of armourstone weirs in the channel.
- Access for Phase 2: Removal of Gabion wall and installation of armourstone wall and armourstone toe protection along the existing concrete wall along the north bank, and removal of Gabion bank protection and the interlocking wall and installation of the vegetated rock buttress along the south bank, east of Camilla Road. Installation of armourstone weirs in the channel.

Assuming there are no outstanding Section 16 Order requests at the end of the 30-calendar day comment period, construction of the proposed works is tentatively scheduled as follows:

- End of 30-day comment period: Month 0
- Detailed Design and Tender period: Month 0 to Month 8
- Construction: Month 8 to Month 14
- Post Construction Monitoring: Month 14 to Month 26

Therefore, it is anticipated that the channel upgrades will take approximately six (6) to eight (8) months to complete, depending on a number of construction variables such as ground conditions and the contractor. Fish timing windows will restrict the time during which the proposed work can occur.

7.5 Estimated Costs and Funding

The cost breakdown is provided in Table 7. The cost estimates presented are based on a conceptual level of design and will be refined as the design work progresses. Due to the continuous conveyance of water within the channel, dewatering and bypassing of the existing flow will be required during construction. The cost estimate does not include disposal costs, utility supports, etc. associated with construction works.

Table 7. Alternative 3 Cost Estimate

Description	Total
Site Preparation	\$500,000.00
Channel Works	\$2,250,000.00
Restoration	\$100,000.00
Contingency (30%)	\$850,000.00
Cooksville Erosion Control Works TOTAL (excluding HST)	\$3,700,000.00

**Costs exclude taxes and future inflation.*

8 Mitigation Measures

Construction of the proposed upgrades to the channel reach within the Study Area are likely to result in some potential negative impacts. In most cases however, potential impacts will be limited to the period of construction and are considered manageable with the appropriate mitigation techniques. Mitigation involves the application of appropriate measures to eliminate or reduce negative impacts to ensure that any disturbances are managed by best available methods. Mitigation measures are discussed in the sub-sections below.

8.1 Utilities Avoidance

As noted in Section 4.6, requests were made to Ontario One Call to complete preliminary utility locates within the Study Area at Camilla Road. All correspondence and locate information made available has been provided in Appendix D. The proposed channel works are not anticipated to impact nor be impacted by the existing utilities. The locates identified a buried Bell cable and an Enbridge gas main west of Camilla Road and a 1200-millimetre (mm) diameter sanitary main, and 150 mm diameter watermain underneath Camilla Road. In addition, according to 1982 City of Mississauga drawing Plan No. C-19960, there is a 1200 mm diameter storm sewer west of the Camilla Road bridge and 600 mm diameter storm sewer east of the Camilla Road bridge.

8.2 Erosion and Sediment Control

There is a risk of erosion and sediment transport downstream of the creek. An increase in sediment transport downstream could ultimately degrade the overall water quality within the

creek. Implementation of a comprehensive Erosion and Sediment Control Plan will be required to prevent migration of sediment downstream of the construction area. This Plan should be completed in accordance with the "Erosion and Sediment Control Guide for Urban Construction" (TRCA, 2019) and include, at minimum:

- Isolation of in-stream work areas with coffer dams and pumps, required to ensure all work is completed in dry conditions;
- Installation of silt fence around the perimeter of the work area, including any construction staging areas. This fencing is to be inspected regularly and is to remain in place until all surfaces contributing to the watercourse are fully stabilized;
- Newly constructed surfaces are to be stabilized and re-vegetated as quickly as possible following completion of the work;
- Installation of mud mats at entrances to the work and staging areas to minimize transport of mud and sediment onto public roads; and,
- Development of a contingency plan in the event that silt is released downstream.

The Erosion and Sediment Control Plan should illustrate the location and details of all erosion and sediment control measures proposed. A maintenance and inspection schedule should also be included in the Erosion and Sediment Control Plan which considers the "Erosion and Sediment Control Inspection Guide" (TRCA, 2008) prepared for the Greater Golden Horseshoe Area Conservation Authorities. The Erosion and Sediment Control Plan will be developed during the detailed design phase of the project prior to implementation.

8.3 Spills Prevention

The Contractor will be required to prepare a Spills Management Plan and always make it available for implementation in the event of a spill (e.g., diesel). The Plan should include a list of materials, instructions regarding their use, and emergency contact numbers, and should indicate that the MECP Spills Action Centre must be contacted in the event of a spill. Contract personnel should be educated regarding the Spills Management Plan. A spill kit containing commercially suitable absorbent material should be maintained on-site and kept in an accessible area in case a spill occurs.

8.4 Fish and Fish Habitat Restoration

Cooksville Creek supports a warmwater fish community. During construction of the channel upgrade, any existing fish habitat may be altered, and water quality may be impacted as a result of site erosion and the release of sediment from the proposed works. The suspension of sediment within the channel can cause respiratory stress, reduced feeding, and altered growth for resident fish species. In addition, the accumulation of sediments can bury instream vegetation that are a food source to local fish populations.

To mitigate these potential impacts, construction within the channel should be completed in dry conditions achieved through isolating the work area using coffer dams and a pump dewatering system. This process will reduce sediment transport, therefore reducing potential adverse effects to water quality within the channel. In addition, all in-water works within the Study Area must be conducted within applicable construction timing windows. As the watercourse has been identified

as warmwater fish habitat, all in-water construction must be completed outside of the timing windows for warmwater fish spring spawning, that is between July 16 and March 14 of any given year, or according to CVC, between July 1 and March 31. Timing should be verified with CVC in advance of works.

The channel upgrade will provide opportunities to improve existing fish habitat within the channel. As previously noted, fish habitat within the existing channel is minimal, but there is an opportunity for moderate improvement to fish habitat by removing and replacing the concrete bed with natural substrate and removing invasive vegetation. The design of all proposed fish habitat will be confirmed during detailed design to ensure the proposed features do not impact the hydraulic function of the proposed channel.

8.5 Wildlife, Wildlife Habitat, and Vegetation Restoration

No Species at Risk (SAR) have been confirmed within the Study Area, though SAR birds, turtles and bats have been found nearby within the Camilla Natural Area. Therefore, there is a moderate to high potential for these species to occur in the Study Area. To ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed by the proposed works, **it is recommended that MECP's SAROntario@ontario.ca** be contacted early during detailed design regarding any additional field investigations required (e.g., bat survey) and potential authorizations under the *Endangered Species Act*.

To protect SAR and their habitat within the Study Area, tree removal will be minimized, and if feasible, construction should be conducted outside of the breeding bird and active bat seasons. It is recommended that all vegetation clearing occur outside of active period(s) for bats and birds (i.e. vegetation clearing should be conducted between October 1 and March 31). All in-water works should occur between July 16 and March 14 (timing to be confirmed with CVC).

Removal of vegetation along the perimeter of the channel may impact terrestrial ecology during construction, as the vegetation helps maintain the ecological integrity of the channel. To reduce these effects, construction access routes should be identified and maintained through the construction process to minimize disturbance. Tree protection measures should be implemented, which includes the installation of tree protection fencing where required. Restoration plantings should be completed following construction, comprised of native species and in accordance with **CVC's Ecosystem Offsetting Guidelines** (CVC, March 2020), *Guidelines for Designing Enhancement Plans within Setbacks and Buffers* (CVC, August 2023), *Plant Selection Guideline* (CVC, April 2018), and *Healthy Soils Guideline* (CVC, June 2017).

Should wildlife be encountered within or adjacent to the work area during construction, the Contractor shall stop work that could harm or harass the species and report the encounter to the onsite inspector. If the species encountered is determined to be threatened or endangered, the City of Mississauga is to be contacted to determine the next course of action and the Natural Heritage Information Centre is to be informed within three months. For more information, refer to **"Report a species sighting" at this [webpage](#)**.

The Contractor on site is to familiarize themselves with the SAR identified in Section 4.2.4 of this report.

8.6 Invasive Species Management

As identified in the Natural Heritage Report (Appendix A), approximately 90 floral non-native species have been identified within the Camilla Natural Area (Figure 10). Excavation of the existing channel will result in the removal of a portion of these invasive species; however, all non-native species located within the work area should be removed prior to the planting of native vegetation post construction. Restoration plans should include invasive species control measures, which may include the application of herbicides. Best Management Practices documents developed by the Ontario Invasive Plant Council should be followed during application of all herbicides used for invasive species management.

8.7 Noise, Odour and Dust Control

As noted in Section 4.4 above, properties adjacent to the Study Area consist mostly of low, medium, and high-density residential land uses. During construction, nuisance effects such as noise, odour and dust are anticipated to impact these neighbouring properties. A Noise, Odour and Dust Management Plan must be prepared during detailed design to mitigate against these potential effects. The mitigation measures included in the Management Plan must be monitored by an onsite inspector, and revisions to the Plan should be made as needed to minimize the effects on adjacent properties as much as possible. Mitigation measures to be included in the Plan may include:

- Minimize idling of construction equipment and keep equipment in good working order;
- Adhere to noise by-laws which restrict any sounds made by construction activities to set hours;
- Use of effective dust suppression techniques and/or best management practices such as on-site watering of stockpiles and unpaved areas using non-chloride dust suppressants;
- Reduce speed limits on unpaved areas on site;
- Use functional and effective emission control devices on equipment and preferably new **or well-maintained heavy equipment and** machinery, preferably fitted with muffler/exhaust system baffles and engine covers; and
- Optimize material transfer operations, including reducing distance for material transfers and drop heights, where possible.

8.8 Construction Access

All construction work and access routes are expected to be within City owned property or City easements. Phase 1 access will be through the City easement located south of 2118 Camilla Road. Phase 2 access will be through the City-owned gravel road located north of 2081 Camilla Road.

The construction access and work areas must be clearly defined using protective fencing or barriers to minimize disturbance on adjacent properties. Restoration of any disturbance on the property must also be completed as part of the proposed work.

Consent to Enter agreements have been secured to enable the geotechnical investigation. It should be noted that further agreements may be necessary to facilitate access for construction, with all site works taking place on city property or within a city easement.

8.9 Excess Materials Management

Removal of sediment, existing Gabion baskets, and concrete from the existing channel will be required during construction of the upgraded channel. These items will need to be characterized and re-used or disposed of in accordance with **Ontario's** On-Site and Excess Soil Management Regulation (Ontario Regulation 406/19).

Any temporary stockpiled material must be properly contained in accordance with Ontario Provincial Standard Specification 180. All construction materials, excess materials, and debris must be removed and appropriately disposed of following construction. Where possible, alternatives to recycle or reuse materials should be investigated to reduce the amount of material directed into landfill facilities.

A geotechnical investigation will be required during detailed design to confirm the soil makeup of material in and around the channel. If hazardous contaminants are found in the sediment at elevated levels, the removed fill will require special handling as well as disposal at an approved facility.

8.10 Archaeological Resources

The Stage 2 Archaeological Assessment (Appendix B) concluded that the Study Area does not retain archaeological potential, and the area can be considered clear of further archaeological concerns. The report was submitted to the Ministry of Citizenship and Multiculturalism (MCM) for approval in October 2022. No grading or other onsite construction activities are permitted until notice of MCM approval has been received.

Notwithstanding archaeological clearance of the current Study Area, if archaeological remains are uncovered during construction, site alteration must immediately stop and the City of Mississauga, Archaeological Services Inc., and the Archaeology Programs Unit of the MCM must be immediately notified. Furthermore:

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the Ontario Heritage Act.
- The *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33*, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Consumer Services is also immediately notified.

Should the proposed work area extend beyond the current Study Area (Figure 1) or should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to further Stage 2 assessment.

8.11 Advanced Notification

Public notification should occur in advance of construction to ensure that area residents are informed. Nearby residents and businesses should be notified directly of impending works.

8.12 Proposed Monitoring and Maintenance

As a part of implementing this project, monitoring must be conducted during construction and post-construction to ensure that:

- Individual mitigation measures are providing the expected control or protection throughout the construction process;
- The mitigation measures are adequate to minimize or eliminate adverse effects; and,
- Additional mitigation measures are provided, if required, to address any unanticipated adverse environmental effects that arise during construction.

The proposed construction and post-construction monitoring should be documented as part of the Monitoring Plans to be developed during detailed design. Subsequent recommendations should be made after construction to determine any required operation and maintenance activities required for the channel. These recommendations should include inspection frequency and clean out requirements for the channel.

9 Communication and Consultation

Communication and consultation are an integral part of the Municipal Class EA process. The purpose is to advise all potentially affected stakeholders of the proposed project and to ensure that any comments or concerns are identified as early as possible, documented, and considered. To meet the Municipal Class EA consultation requirements for this Schedule B study, Indigenous communities, nearby property owners and members of the public, regulatory review agencies, and other potentially relevant stakeholders were contacted using a variety of communication tools including e-mail, phone, individual meetings, and an online Public Information Centre (PIC). Other activities included posting of information on the [project website](#) and distribution of the notices to residents within the Study Area. The following sections document these activities and the feedback received, where applicable.

9.1 Public Communications and Consultation Activities

Public communication and consultation activities included e-mail distribution of all three (3) project notices to those on the project mailing list, mailing of the notices to residents within the Study Area, an online PIC, and correspondence with interested property owners. The sub-sections below provide further details regarding these activities. Table 8 below summarizes the issues that were raised and how they have been addressed. For further reference, a copy of all key communication materials and correspondence is included in Appendix D.

9.1.1 Project Mailing List

A project mailing list was compiled at the project start and updated throughout the study as required. In addition to the review agencies and Indigenous communities discussed in Sections 9.2 and 9.3 below, the mailing list included local property owners, utilities, service providers, elected officials, and City of Mississauga and Region of Peel staff. The mailing list was developed based on past projects and the requirements of the Municipal Class EA document. Members of the public and other interested stakeholders were then added to the list as requested. A copy of the final project mailing list (with personal information obscured) is provided in Appendix D.

9.1.2 Notice of Study Commencement

The proposed project was first introduced to the public via the Notice of Study Commencement. The notice included a brief description of the study purpose and process, a Study Area map, and study team member contact information. The notice was e-mailed to all those on the project mailing list on October 28, 2021, and delivered to property owners within the Study Area that same week. The notice was also made available on the [project website](#).

Other than general information and requests to be added to the project mailing list, no comments were received from local property owners or members of the public as a result of publication of the Notice of Study Commencement.

9.1.3 Notice of Online Public Information Centre

Due to the COVID-19 pandemic and concerns over public health and safety, the PIC was held via an online format, with project informational materials posted on the project website on April 13, 2022 and completion of an online survey or e-mail submission of comments requested by May 4, 2022.

The Notice of Online PIC again included a brief description of the study purpose and process, a Study Area map, and study team member contact information. In addition, it also included notification that the preliminary preferred solution was replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road. The notice also provided an invitation to review the project materials and provide feedback.

The notice was e-mailed to all those on the updated project mailing list on April 13, 2022, and delivered to property owners within the Study Area that same week. City of Mississauga staff also directly notified the Councillor for Ward 7 and the notice was made available on the [project website](#).

9.1.4 Online Public Information Centre

As advertised in the notice, the Online PIC was formally held from April 13, 2022 to May 4, 2022, although comments were accepted throughout the duration of the study. An online survey was also made available to the public during the PIC. The survey asked general questions but was designed to get respondents thinking about various aspects of the project, including the information presented on existing conditions within the Study Area, the preliminary preferred solution, and the Schedule B Municipal Class EA process. The online survey questions are included in Appendix D.

A total of eleven (11) comments were received from the public via e-mail, the online survey, or verbally via telephone. Comments received from local property owners or members of the public included requests to be added to the project mailing list, general support for the project, information sharing, and/or requests for additional information. Table 8 at the end of this section summarizes the issues that were raised and how they have been addressed.

During the online PIC, Alternative 3 – Reach Scale Improvements was brought forward as the recommended solution for stakeholder review and comment. However, following the online PIC, Resilient conducted a detailed hydraulic analysis of the preferred alternative which led to a modification of the original design. Instead of replacing the entire concrete channel with an armourstone-lined channel as previously proposed, the decision has been made to retain and repair approximately 28 meters of the existing concrete channel, just upstream of the bridge. See Sections 6.3.1 and 7.1.2 for more details.

9.1.5 Notice of Study Completion

The Notice of Study Completion explained that this Project File report has been made available on the [project website](#) for public review and comment for a period of 30-calendar days. The notice formally requested written comments within the 30-day comment period, starting on March 6th and ending on April 4, 2024. As per the Municipal Class EA requirements, the notice also provided further details regarding the process for submitting written objections to the Minister of the Environment, Conservation and Parks within the 30-day comment period.

The notice was e-mailed to all those on the updated project mailing list on March 6, 2024, and hand delivered to property owners within the Study Area that same week. The notice was also made available on the project website.

If no written objections are received by April 4, 2024, the City of Mississauga intends to proceed with detailed design and construction as outlined in this report.

Table 8. Public Comments and Response Summary

No.	Received from/Type/Date	Comment or Comment Summary	Response
1	E-mail from resident, November 5, 2021	<p>My wife and I have lived at [REDACTED] for the past 35 years and have watched the changes in the creek behind our house due to the erosion of the west side of the creek.</p> <p>A few years ago, there was a collapse of the rock retaining wall on the east side and since then the erosion on our side has accelerated because of the change in the water flow coming around the bend. Just this year, we preemptively took down a large tree at the edge of the creek before the erosion around it would cause it to fall in.</p> <p>We are very interested in this project and the proposed solutions to this problem. Please add our names to the mailing list.</p>	Added to the project mailing list.
2	E-mail from President of nearby Condominium Corporation, November 11, 2021	<p>We wanted to get involved with this study as the creek is a major worry for our residents [REDACTED].</p> <p>Over the years we have had some serious high-water levels and several years ago one major catastrophe where nearly 50% of our basements were flooded out with insurance claims being close to \$1m for fixes and clean up, and rebuilding.</p> <p>I personally was part of the Mayor’s task force for going forward and hence the Matheson pond was born out of the various inputs from the committee members.</p> <p>Now that the city is well on its way to procuring approximately 30 floodplain properties around Paisley Blvd, Sheprd Ave., Frayne and Adena for the future Centre Park and underground storage, the last hurdle is the MTO and the QEW creek culvert which has always been in discussion from many studies going</p>	Added to the project mailing list.

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>back many tens of years, but sadly was missed out of the QEW interchange redesign a few years ago.</p> <p>So we have a lot of history living along the creek for many years. We request that we be included in any study, Zoom meetings, etc. going forward.</p> <p>This note is copied to our property manager [REDACTED]</p>	
3	<p>Online comment received from resident near Cooksville Creek, April 12, 2022</p>	<p>From the diagrams, I do not see any bank protection behind [REDACTED]. Having lived here for 35 years, we have lost considerable property to the erosion along the section behind our house. There is some protection along the east side of the creek but nothing on the west side of the creek. How far down the creek will bank protection be installed on the west side? Will it be as far as the new bridge installed at the path as there is considerable erosion all along this side?</p>	<p>The Study Area ends between the property lines of 2081 and 2069 Camilla Road and therefore construction will be limited to this area. During our initial site assessments, our fluvial geomorphologist indicated that the banks south of the Study Area appear relatively stable and do not require further protection. In addition, energy dissipation in the Study Area will be a critical element during the design of the preferred alternative. Energy dissipation elements such as armourstone or rock weirs will be used to dissipate erosive forces in the watercourse through the Study Area, which should limit erosion occurring downstream of the site.</p> <p>In addition to the above, we also suggest leaving a buffer strip of vegetation along the top of the creek bank to help limit erosion. We suggest to limit grass cutting and vegetation trimming in this area.</p>
4	<p>Online comment received from resident near Cooksville Creek, April 13, 2022</p>	<p>I strongly support the option to replace and cleanup the channel. It has become an area where a lot of garbage collects and due to poor drainage and the smell is bad on certain days. I own a property on Lorelei Road and due to the failing wall a few trees fell or are falling and where there was a fence to prevent anyone from falling over the edge - that fence fell. My hope is that when the wall is rebuilt that a fence get constructed at the top for safety reasons. We've lost a bit of land to the erosion</p>	<p>A new fence will be constructed on top of the proposed wall behind your property for safety reasons as you have mentioned.</p>

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>putting our property line at risk. Our neighbours' properties are also having the same issue.</p> <p>Cleaning up the area to remove the debris will help fish and wildlife. There are a lot of trees that are dead, dying and falling. I expect many will be removed and sincerely hope that there is significant replanting of trees and bushes to refresh this area.</p> <p>I'd like to know how long this project will take, once approved and be kept updated. This is a very much needed refresh that will enhance the area especially after the significant investment in the powerline path that was just created.</p>	<p>The area will also be replanted with native trees and bushes to compensate for trees removed as part of the project. Many of the trees and bushes in the area are actually invasive species and we anticipate a net benefit to the site following restoration.</p> <p>The current Municipal Class Environmental Assessment study is anticipated to be completed later this year and email notification will be provided. At this time, construction is anticipated in 2024 and will likely take approximately 4-6 months to complete. Notification will again be provided in advance.</p>
5	Online comment received from resident near Cooksville Creek, April 24, 2022	<p>This project started without even consulting the community. There is NO BOARD announcing the project, just daily lots of municipal trucks and vehicles and tree cutting from our creek and parks. We should be informed and public should be made aware of the timeline and why is it needed to cut so many trees from this area populated by wildlife too.</p> <p>It seems each time the City has a plan in this area, it starts by first acting and then consulting the public. There is no transparency or communication with the neighborhood.</p>	<p>Construction for this project has not yet started and is planned for 2024. We are currently in the public engagement phase of the project as part of the Municipal Class Environmental Assessment (EA) study. We intend to keep the public informed as the project proceeds.</p> <p>Completion of the Project File (EA report) for this project is tentatively planned for Fall 2022. You will then receive email notification that the Project File is available for review. In the meantime, if you have concerns about current construction in your area, we recommend contacting the City's customer service line by dialing 3-1-1 (or 905-615-4311 outside of the City limits).</p>
6	Email from resident in reply to Response #3 above, May 10, 2022	Thanks for your reply. I am not a fluvial geomorphologist, but I disagree with how stable the west side of the creek is. I have lived here for 37 years and have watched the erosion over those years. The collapse of the wall at the corner several years ago exacerbated the erosion, so much so that I had to have a large tree removed before it fell into the creek.	Thank you very much for this information. The study area was selected focusing on addressing key at-risk infrastructure, including the failing concrete channel upstream of the Camilla Road bridge and the failing gabion walls at the outer bend downstream of the bridge. As the creek behind your house is in a more naturalized state with banks in fair condition and was identified by

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>I have pictures from 35 years ago which show the width of the creek at that time plus I have a survey from 1973 which shows the location of the creek 50 years ago. It is at least 10 wider now behind my house.</p> <p>Extending the erosion control another 150' to the bridge would not at a considerable cost to the project given how much is being spent upstream.</p>	<p>our fluvial geomorphologist as being relatively stable, we are not planning any works in this area.</p> <p>As noted in my earlier email, and it's worth noting again, energy dissipation in the study area will be a critical element during the design of the preferred alternative. Energy dissipation elements such as armourstone or rock weirs will be used to dissipate erosive forces in the creek, which should help limit erosion occurring downstream of the study area.</p> <p>To help address any erosion concerns downstream of the study area, we recommend homeowners maintain an approximate 4 metre (m) wide, no-mow, naturalized buffer along the edge of the creek to promote soil stability through deeper root establishment.</p> <p>The City has an extensive creek monitoring program that regularly monitors all creeks and rivers throughout the City. As part of that program, the City will continue to monitor and re-evaluate this stretch of Cooksville Creek on a regular basis.</p> <p>We appreciate you taking the time to provide your thoughtful comments and share this information with us.</p>
7	Phone call from President of nearby Condominium Corporation, August 3, 2022	<p>Happy with the process followed – what is the current schedule?</p> <p>Is the City working with MTO to upgrade the Cooksville Creek crossing under the QEW?</p>	<p>The overall project schedule has been a bit delayed due to the Stage 2 Archaeology Assessment, but the Study Team is currently proceeding with preparing the Project File report.</p> <p>The Study Team is not aware of any plans by MTO to upgrade the QEW Cooksville Creek crossing.</p>
8	Email from resident, October 14, 2022	I heard about the project and would like to know if the project has been approved and a date been set to commence the work.	Thanks for reaching out and for your interest in the study.

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>Furthermore, I would greatly appreciate to be added to the mailing list to receive further notifications.</p>	<p>We're currently progressing through the Environmental Assessment (EA) study phase of the project and then will begin design work and acquiring project approvals. Once the EA phase has been completed, stakeholders will be notified, and a project file will be posted to our webpage for review and comments. At the moment, our best estimate is that construction could begin in 2024 at the earliest, subject to approvals and our EA/design work progressing.</p> <p>As outlined in our past Public Information Centre (PIC) materials, which are available on the project webpage, our preliminary preferred solution includes a potential replacement of the leaning interlock retaining wall north of your property with a new protected slope or wall. This existing wall runs east-west along the south bank of the creek and is located within City property. As we begin the design phase of the study, we expect the new slope or wall will be contained within these lands and be reasonably set back from your property.</p> <p>We are also continuing to complete environmental field work in the area and may be notifying you in the future of any nearby field work planned to take place.</p> <p>As requested, we will add your email to the project mailing list to receive future study updates.</p>
9	<p>Email from resident in reply to Response #8 above, October 17, 2022</p>	<p>Thank you for the response and hope the actual work will commence in 2024.</p> <p>A month after I moved to Camilla my neighbours informed me of the flooding that occurred in 2013.</p> <p>I am very concerned with what happened and wonder if you can advise what was the root</p>	<p>The occurrences of flooding for Cooksville Creek are primarily related to the urban and developed nature of the watershed and increasing frequency of high intensity storm events such as the July 8, 2013 event.</p> <p>It's important to note that the main purpose of this project is to address existing erosion problems within the creek and it is not a flood mitigation project. However, a separate flood study for Cooksville Creek was previously</p>

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>cause of the floods and if the City of Mississauga took any measure to mitigate this issue.</p>	<p>completed by the City with the objective of reducing the occurrences of riverine flooding for homes and properties adjacent to the creek across the entire watershed.</p> <p>Initiatives recommended from that study included flood storage (stormwater ponds) in upstream locations to reduce flows to the creek, capacity upgrades to the creek, berming and local control measures. These initiatives have been constructed, are underway or are planned for future implementation as part of the City's Stormwater program. The stormwater pond constructed in Saigon Park is one example and details on that project can be found here. The Cooksville Creek flood study can be found here.</p> <p>There are also specific local conditions throughout the watershed that impact the ability to reduce flooding. Specific to your neighbourhood, the existing culvert under the OEW currently acts as a pinch point or restriction during certain storm events creating a backwater effect upstream. The culvert is owned by the Ontario Ministry of Transportation (MTO) and we are not aware of any current plans by the MTO to replace this structure.</p> <p>While completely eliminating the risk of flooding across the watershed is challenging, through the flood study initiatives we are able to reduce the occurrences of flooding and provide an overall improvement.</p>
10	Email from resident, May 2 and 8, 2023	<p>I wanted to follow-up to see if this project was firmly in the calendar to begin in 2024. The erosion behind my house and neighbors' houses is getting increasingly worse.</p>	<p>We appreciate your follow-up and thank you for advising us on the status of the erosion. One of our staff will drop by the site to check current site conditions.</p> <p>In terms of timing for implementation, the project is now currently scheduled for 2025, subject to Council budget</p>

No.	Received from/Type/Date	Comment or Comment Summary	Response
		<p>----- My neighbor at [REDACTED] is significantly impacted by the erosion as well.</p> <p>It is disappointing that the timeline slipped a year and budget still pending. The erosion coupled with buildup of debris and garbage is a growing concern that requires attention.</p>	<p>approval, to better reflect the timing needed to complete geotechnical field work and acquire environmental permitting and approvals for construction.</p>
11	Email from resident, August 1, 2023	<p>As a follow-up to ravine work: Crews are working now to remove many fallen trees. The erosion is continuing to cause significant damage and disruption, and all the neighbors connected to the creek are concerned and will raise complaints.</p> <p>We've lost several large trees along this small creek area in this summer alone. During a rainstorm the waters raise very high and continue to chew away the landscape.</p> <p>Looking for confirmation on the plan to move forward, timeline and any thoughts on how me and the neighbors can escalate further. This is also a safety concern as people do walk around the area.</p>	<p>Thank you for bringing this to our attention. Cooksville Creek is indeed a very flashy urban watercourse, and we understand the concern of the residents – these concerns may be voiced to your Ward Councillor.</p> <p>The 2025 timeline should allow for the acquisition of permitting for approvals and construction as we've been working through some technical issues with the local Conservation Authority. As we work through this, stormwater management facilities continue to be implemented upstream that are supporting the mitigation of peak flows. While these facilities are helping, we understand the toll that summer storms bring and take these concerns seriously. We will do our utmost to adhere to the timeline noted here.</p>

9.2 Review Agency Communication and Consultation Activities

In addition to the public communication and consultation activities described above, relevant regulatory review agencies and service providers (utilities) as listed in the project mailing list (Appendix D) were also provided with a copy of the Notice of Study Commencement, Notice of Online PIC, and Notice of Study Completion. Additional correspondence was exchanged with the agencies noted in the sub-sections below.

9.2.1 Credit Valley Conservation

Preliminary Comments

In response to the Notice of Study Commencement, CVC provided preliminary comments on December 7, 2021. CVC asked to be kept informed throughout the study and requested that any **project information or reports be sent to CVC for review to ensure that CVC's** policy and program interests are reflected in the project planning and design. Other key comments are summarized as follows:

- Study Area site characteristics include CVC regulated area, floodplain, valley slope, SWH, and both Credit River Watershed and City of Mississauga Natural Heritage System features.
- Hydraulic analysis will be required in support of any erosion control works that involve altering the floodplain or channel. CVC staff should be consulted to discuss submission expectations.
- Geotechnical investigation and slope stability analysis will be required if the proposed works involve disturbing or altering the valley slope or altering the slope hazard. The slope **stability analysis is to be completed in accordance with CVC's Slope Stability** Guideline. CVC staff should be consulted prior to commencing any geotechnical works.
- An erosion hazard assessment may be required to demonstrate that the proposed works do not result in offsite impacts to neighbouring properties. CVC staff should be consulted to discuss submission expectations.
- Fish habitat, passage, and instream cover should be enhanced where possible. Work should be completed within the warmwater timing window (July 1st to March 31st), in dry weather, and with a comprehensive Erosion and Sediment Control Plan in place.
- **Considering SWH and other sensitive features, the project's ecological footprint should be** minimized and appropriate timing windows and construction duration, access points, and construction staging areas carefully considered.
- Any potentially destructive or disruptive activity such as vegetation clearing should be **avoided between April and August in consideration of migratory birds and the City's** responsibilities under the *Migratory Birds Convention Act*.
- If it is not possible to avoid or mitigate impacts to fish or fish habitat, a Request for Review **should be submitted to DFO's Fish and Fish Habitat Protection Program office.**

- Other relevant agencies such as the MECP and Ministry of Natural Resources and Forestry (MNRF) should be contacted for any necessary mitigation opportunities and permit requirements regarding SAR, fish, and/or wildlife, as appropriate.
- Softer bank stabilization techniques should be considered throughout the reach to contribute to water quality and habitat enhancement.
- It is highly recommended that fish passage and terrestrial wildlife passage be included as a goal within the proposed project.

A project meeting was held May 6, 2022, at the Study Area, with staff from the City of Mississauga, CVC, GEO Morphix, North-South Environmental, and Resilient Consulting. During the site walk, key discussion points included project background information, scope of the Municipal Class EA, alternative designs and permitting requirements. Meeting minutes are available upon request.

Hydraulic Model

In addition, Resilient had three (3) consultation meetings with CVC to discuss the hydraulic modeling for this project. The meetings took place on the following dates:

- October 06, 2022
- December 06, 2022
- August 16, 2023

A summary of each meeting is provided below.

October 06, 2022: During this meeting, Resilient discussed how the preferred option was resulting in model instability concerns downstream of Camilla Road associated with the new cross-section downstream of the crossing within the 1D HEC-RAS model. CVC suggested removing the newly added cross sections to assess if the 1D model achieves stability.

December 06, 2022: During this meeting, Resilient addressed the ongoing issue of inconsistent water surface elevations through the 1D modelling. Resilient provided an overview of various scenarios that had been tested, and the team decided to update CVC's existing 2D model to assess the impact of the proposed project works.

August 16, 2023: During this meeting, Resilient discussed the inconsistent 2D model results and recent hydraulic 1D model updates based on using a hybrid approach where a portion of the concrete channel is retained to function as a hydraulic apron. This approach works on site without potential property issues and was found to offer superior model results. CVC accepted Resilient's proposed design alteration.

Draft Project File

A copy of the Draft Project File was issued to CVC for review on December 19, 2023. Comments were received on January 19, 2024, which were addressed and incorporated into this final Project File, as appropriate.

9.2.2 Fisheries and Oceans Canada

Fisheries and Oceans Canada (DFO) does not typically respond to Class EA notifications or requests for comment. However, a general response to the Notice of Study Commencement was

received indicating that DFO reviews project proposals for impacts to SAR, and for work being conducted in or near waterbodies that support fish. They provided a website address where information is provided to determine whether the project requires DFO review, and if it does, how to submit a Request for Review Form.

A Request for Review Form should be submitted to DFO as part of detailed design, to definitively determine if a *Fisheries Act Authorization* will be required prior to construction.

9.2.3 Transport Canada

Transport Canada responded to the Notice of Online PIC on April 21, 2021. They requested that the study team self-assess whether the proposed project will interact with a federal property and/or waterway and require approval and/or authorization under any of the Acts administered by Transport Canada. If not, Transport Canada requested to be removed from the mailing list.

Cooksville Creek is not considered federal property, and the *Navigable Waters Act* would not apply because the existing concrete channel and QEW culverts act as barriers for boat passage or any **other "navigation" at the Study Area. Likewise**, no other approvals or authorizations are required from Transport Canada. Therefore, Transport Canada was removed from the mailing list and no further correspondence is anticipated.

9.2.4 Crown-Indigenous Relations and Northern Affairs Canada

Crown-Indigenous Relations and Northern Affairs Canada responded to the Notice of Study Commencement on November 2, 2021. Crown-Indigenous Relations and Northern Affairs Canada comments provided information about the online Aboriginal and Treaty Rights Information System which can be used to identify the location of Indigenous groups and provide users with information **pertaining to each group's established or asserted rights**. The requirement for further correspondence with Crown-Indigenous Relations and Northern Affairs Canada is not anticipated.

9.2.5 Ministry of Environment, Conservation and Parks

The MECP responded to the Notice of Study Commencement on November 2, 2021 by providing information regarding procedural aspects of the Municipal Class EA and their **"Areas of Interest"** with respect to the Municipal Class EA process. The Areas of Interest checklist has been filled out and included in Appendix D.

Also included was "A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities" and a listing of communities who MECP identified as potentially affected by the proposed project.

As per MECP's request, a draft copy of this Project File was issued for review on December 20, 2023. However, it was confirmed on February 6, 2024 that the MECP has no comments at this time.

9.2.6 Ministry of Citizenship and Multiculturalism

A copy of the finalized Stage 1 and Stage 2 Archaeological Assessments were provided by Archaeological Services Inc. to the MCM (formerly the Ministry of Heritage, Sport, Tourism and Culture Industries) for review and approval in September and October 2022. A clearance letter from the MCM will be required prior to construction start.

9.2.7 Utilities

In addition to the Ontario One Call request described in Section 4.6, the following utilities or service providers were provided with the public notices:

- Alectra Utilities
- Bell Canada
- Enbridge Gas
- Hydro One Networks
- Rogers Communications
- TELUS
- TransCanada Pipelines
- Trans-Northern Pipelines

On November 2, 2021, Trans-Northern Pipelines responded that they currently operate a high-pressure petroleum products transmission pipeline within the Cooksville Creek and would like to be aware of any future planning and design of this project. On November 3, 2021, Hydro One Networks advised that they do not have any existing Hydro One Transmission assets within the Study Area. No other comments have been received to date.

It is expected that during detailed design, plan and profile drawings of the proposed works will be circulated to all relevant utilities and any conflicts will be addressed at that time.

9.3 Indigenous Communities Communication and Consultation

Various Indigenous communities were identified as potentially having interests in the general area using the online Aboriginal and Treaty Rights Information System and based on the MECP correspondence dated November 2, 2021. All project notices were sent to the identified communities to advise them of the project and provide an invitation for involvement and/or input. The potentially interested communities identified included:

- Mississaugas of the Credit First Nation
- Huron-Wendat Nation
- Haudenosaunee Confederacy Chiefs Council
- Six Nations of the Grand River

With the exception of the Six Nations of the Grand River who did not respond to any communications, the Study Team has been in contact with representatives of these communities, predominantly regarding their involvement in the Stage 2 archaeological investigations. Appendix B includes **Archaeological Services Inc.'s Indigenous Engagement report (July 2022)**. A final request for comments will be made with distribution of the Notice of Completion.

9.3.1 Mississaugas of the Credit First Nation

In response to the Notice of Study Commencement issued to Indigenous communities on November 5, 2021, a response letter was received from the Mississaugas of the Credit First **Nation's Department of Consultation and Accommodation on March 8, 2022. The letter provided information regarding their Rights and Territory and the City's Duty To Consult for this project.** The letter also provided additional contact information and requested additional project information, which was issued on April 7, 2022 along with a copy of the Stage 1 Archaeological

Assessment for review and comment. On April 28, 2022, a representative of the Mississaugas of the Credit First Nation confirmed they had reviewed the Stage 1 report and agreed with its recommendations to conduct Stage 2 work.

The Notice of Online PIC was issued April 13, 2022, along with more information regarding the planned Stage 2 archaeological investigations. Coordination regarding their participation in the Stage 2 fieldwork occurred between April 18th and June 1st, including execution of an agreement with the City to participate. However, final confirmation was not received, and the Mississaugas of the Credit First Nation did not participate in the fieldwork.

A letter regarding the Stage 2 work was received by Archaeological Services Inc. on June 14, 2022, and a response was issued June 15, 2022. The Stage 2 Archaeological Assessment was then sent for review and comment on August 26, 2022. On September 2, 2022, the Mississaugas **of the Credit First Nation indicated that they appreciated Archaeological Services Inc.'s due diligence in digging more than 1m to confirm deep disturbance and that they did not have any questions or comments regarding the report.**

9.3.2 Huron-Wendat Nation

A response was received from the Huron-Wendat Nation on November 9, 2021, acknowledging receipt of the Notice of Study Commencement and requesting to be consulted, to be involved in all archaeological fieldwork, and to receive copies of the draft reports for review and comment. The Stage 1 Archaeological Assessment was sent to the Huron-Wendat Nation for review on February 15, 2022. A response was received on April 14, 2022 indicating that they did not have any comments or concerns.

In addition to the Notice of Online PIC sent April 13, 2022, coordination regarding the Huron-**Wendat Nation's participation in the Stage 2 archaeological** fieldwork occurred between April 14th and June 1st; however, final confirmation was not received and the Huron-Wendat Nation did not participate in the fieldwork. The Stage 2 Archaeological Assessment was issued for review and comment on August 26, 2022. No response has been received to date.

9.3.3 Haudenosaunee Confederacy Chiefs Council

The Haudenosaunee Development Institute responded on April 19, 2022 to the Notice of Online PIC by requesting a phone call to discuss the project and its status. An online meeting was then arranged, and a copy of the Stage 1 Archaeological Assessment was sent for review on May 10, 2022. An online meeting was held May 11, 2022 where information regarding the project background, status, and preliminary preferred solution was discussed.

Coordination regarding participation in the Stage 2 archaeological fieldwork occurred following the meeting, and Haudenosaunee Development Institute participated in the fieldwork on June 6, 2022. The Stage 2 Archaeological Assessment was issued for review and comment on August 26, 2022. No response has been received to date.

10 Project Implementation

The following sections discuss the permit and approval requirements anticipated during detailed design and the recommended construction staging to be confirmed as part of the later phases of the project.

10.1 Permits and Approvals

As the proposed channel erosion control upgrades are located within a regulated area and will require in-water works, review and approval by a variety of review agencies will be required. Table 9 below summarizes the anticipated approval requirements for the project.

Table 9. Summary of Permits and Approvals

Agency	Required Permit/ Approval	Justification
Credit Valley Conservation (CVC)	Permit Under Ontario Regulation 160/06	The Study Area is located in an area regulated by CVC. Consultation with CVC has been undertaken as part of the Municipal Class EA process and must continue during detailed design. Permit application to be submitted during detailed design.
Fisheries and Oceans Canada (DFO)	Authorization under the <i>Fisheries Act</i>	DFO review will be required based on fish and fish habitat protection provisions (2019). A DFO Request for Review must be undertaken during the detailed design phase.
Ministry of Environment, Conservation and Parks (MECP)	Authorization under the <i>Endangered Species Act</i>	Given there is a moderate to high potential for SAR to occur in the Study Area, SARontario@ontario.ca should be contacted regarding any potential authorizations required under the <i>Endangered Species Act</i> .
Ministry of Citizenship and Multiculturalism (MCM)	Archaeological Clearance	The finalized Stage 1 & 2 Archaeological Assessments have been submitted to MCM for review and approval. No work is permitted until notice of MCM approval has been received.

Should additional permitting or approval requirements be identified during detailed design, they must also be obtained during the detailed design phase and prior to construction start.

11 Next Steps and Future Commitments

Upon completion of the 30-day public comment period and Municipal Class EA clearance, it is recommended that the preferred solution proceed to detailed design, approvals and construction as outlined in this report.

The following list provides a preliminary set of commitments that must be completed prior to implementation of the proposed Cooksville Creek upgrades and/or post construction:

- Confirm mitigation measures outlined in Section 8, including avoidance of existing utilities and further refinements to be completed during the detailed design stage;
- Develop detailed design drawings and comprehensive plans, including Removals Plan, Erosion and Sediment Control Plan, Grading Plan, Spill Management Plan, Noise, Odour

and Dust Management Plan, Restoration Plan, and Construction and Post-Construction Monitoring Plans;

- Undertake a geotechnical assessment and slope stability analysis to confirm soil quality for offsite disposal, groundwater elevations, and slope stability. Consult with CVC prior to any geotechnical works and in regard to the required slope stability analysis;
- Undertake an erosion hazard assessment to establish both the existing and proposed erosion hazard limit to demonstrate that the proposed works do not result in offsite impacts to neighboring properties. Consult with CVC regarding their requirements for this work;
- Continue to consult with review agencies (CVC, DFO, MCM, etc.), utilities, Indigenous communities, and other relevant stakeholders, as applicable;
- Initiate discussions with adjacent property owners to obtain permission to enter agreements, as required;
- Provide advanced notification of construction to adjacent property owners;
- Obtain permits and approvals identified in Table 9.
- Implement the works as described in Section 7.1.
- Following construction, restore all disturbed areas to their existing condition or better.

If additional measures are noted during the detailed design phase, these are to be captured as part of the construction tender documents.

APPENDIX A

Natural Heritage Technical Memo

Memorandum

To: Mark Bassingthwaite (Resilient), Adam Nespolo (Resilient)

From: Leanne Wallis, Devin Bettencourt (North-South Environmental Inc.)

Date: September 12, 2022

File: Cooksville Creek Erosion Control Project at Camilla Road (City of Mississauga 20-018, NSE 21-1238)

cc: Kristen Harrison (North-South Environmental Inc.)

Re: **Natural Heritage Technical Memo for the Cooksville Creek Erosion Control Project at Camilla Road, City of Mississauga, Ontario**

1.0 Introduction

North-South Environmental Inc. (NSE) was retained as part of the project team, led by Resilient Consulting to conduct natural environment studies in support of the Cooksville Creek Erosion Control Project at Camilla Road, City of Mississauga, Ontario (the "Study Area"). Ecological work was conducted to inform the design and construction of erosion control measures and as input to a Class EA. This reach of Cooksville Creek consists of an engineered channel constructed approximately 30 to 40 years ago. Some of the issues identified by the City of Mississauga include 1) failed gabion basket walls 2) fractured bed and banks of the concrete-lined channel, and 3) accumulation of sediment, debris, and in-channel vegetation growth. The City wishes to develop a restoration plan that mitigates the existing erosion problems and provides long-term stability to the channel corridor.

NSE staff conducted a fish habitat assessment and terrestrial resources assessment (ecological land classification, botanical inventory, incidental wildlife, notable trees) on October 19, 2021. NSE has extensive knowledge of the general area due to its involvement with the City of Mississauga's Natural Areas Survey. Since 1995, NSE has collected natural heritage data for the Camilla Natural Area (Site CV8) every four to five years as part of the survey rotation schedule. This data contributed to the natural heritage characterization of the Study Area provided in this memo. The Study Area is part of the Camilla Natural Area (Site CV8) (see **Figure 1**, below, for the [Study Area](#), and see **Appendix 1** for the Camilla Natural Area Site CV8 report which includes a map of the [Camilla Natural Area](#)).

Figure 1: Study Area



2.0 Data Collection and Methods

2.1 Background Review

NSE reviewed the following sources to identify potential natural heritage constraints and sensitivities:

- Background searches for designated significant features (e.g., provincially significant wetlands (PSW), Areas of Natural and Scientific Interest (ANSIs), etc.), land types and landforms, and Species at Risk (SAR) or locally significant species:
 - Ministry of Natural Resources and Forestry (MNRF) / Natural Heritage Information Centre (NHIC) screening for SAR (Online 2021);
 - Land Information Ontario (LIO) mapping (Government of Ontario 2021); and
 - Fisheries and Oceans Canada Aquatic Species at Risk mapping (Fisheries and Oceans Canada (DFO) 2021).
- Review of available background studies and species lists:
 - Credit Valley Conservation and Region of Peel Natural Areas Inventory (Online 2021);
 - Cooksville Creek Watershed Study and Impact Monitoring Characterization Report (Aquafor Beech Ltd, 2011)
 - City of Mississauga Natural Areas Study - Camilla - Natural Area Site CV8 (City of Mississauga 2021);
 - Atlas of the Breeding Birds of Ontario (Online 2021);
 - iNaturalist (Online 2021);
 - eBird (Online 2021);
 - Ontario Butterfly Atlas (Online 2021);
 - Ontario Moth Atlas (Online 2021); and
 - Ontario Reptile & Amphibian Atlas (Online 2021).
- Review of technical guidance documents:
 - Natural Heritage Reference Manual (OMNR 2010);
 - Significant Wildlife Habitat Technical Guide (OMNR 2000); and
 - Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015)

NSE also requested and received background information from MECP.

2.2 Fish Habitat Assessment

A fish habitat assessment was completed on October 19, 2021 for the reach of Cooksville Creek within the Study Area. This assessment included: observations of fish (as applicable), substrates, instream-cover, wetted and bankfull width, water and bankfull depth, in-stream (as applicable) and riparian / bank vegetation. Through the assessment specific consideration was given to identify existing constraints and opportunities to improve fish habitat and fish passage.

2.3 Terrestrial Resources Assessment

Terrestrial field assessments were conducted on October 19, 2021 in the Study Area, concurrent with the fish habitat assessment. In addition, NSE has collected terrestrial resource data for the Camilla Natural Area (Site CV8) as part of surveys that NSE has conducted for the City of Mississauga's Natural Areas Survey program. Since 1995, NSE has conducted ecology surveys in the Camilla Natural Area (years 1995, 2000, 2005, 2009, 2013, 2017, and 2021). Field work for the NAS focuses on areas of public ownership. Site visits for CV8 were conducted in the woodlands to the north and south of the Study Area (in parks / public lands) and supplemented through imagery analysis where site access is not available. Combined, this data presents a strong characterization of the flora and fauna that regularly or sporadically use the habitat found in the Study Area and immediate environments, as well as the natural area's sensitivities and functions. The Natural Areas Survey 2021 summary report for Camilla Natural Area (Site CV8) is included in **Appendix 1**.

2.3.1 Ecological Land Classification

Ecological Land Classification (ELC) data was reviewed and confirmed during the site visit.

2.3.2 Flora and Fauna Inventory

Supplemental flora and fauna species records were collected, with a specific focus on Species at Risk, provincially, and locally rare or uncommon species.

2.3.3 Notable Trees

The presence of any significant trees [i.e., those with diameter at breast height (DBH) >150 cm] was recorded, including species name, geographic coordinates, DBH, height, crown width, and health (e.g., trunk integrity, crown health, crown vigour and overall condition). In addition, single trees or tree groupings of trees that present potential constraints or opportunities for protection were delineated. These activities were carried out by an ISA Certified Arborist (P. Catling, ON-2721A).

2.4 Significant Wildlife Habitat Assessment

Significant Wildlife Habitat (SWH) in the Study Area was identified using the SWH Criteria Schedules for Ecoregion 7E (MNRF, 2015). Candidate SWH was identified and confirmed where possible based on background information and field data.

2.5 Species at Risk Screening

A list of Species at Risk (SAR) which could potentially occur in the area was compiled based on the background review. The SAR screening includes species which are listed under the provincial *Endangered Species Act* (ESA), and / or federal *Species at Risk Act* (SARA) (2002), plus species that have been assessed as SAR by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

but have not yet been listed. Presence of habitat which could support potential SAR species within the Study Area was verified during the site visit.

All federally listed aquatic SAR species receive protection under SARA. All provincially listed Endangered or Threatened species (aquatic and terrestrial) receive protection under the ESA. Provincially listed Special Concern species do not receive protection under the ESA, however, the species and their habitat are protected as Significant Wildlife Habitat, which municipalities are required to protect from incompatible development per the direction of the Provincial Policy Statement.

3.0 Results

3.1 Fish Habitat Assessment

Cooksville Creek enters the Study Area in a southerly direction, curves to flow approximately west to east before curving south, eventually draining into Lake Ontario. It has a warm water thermal regime. Land Information Ontario mapping indicates 16 fish species are present within Cooksville Creek, including the reach where the Study Area is located. These species include: Blacknose Dace (*Rhinichthys atratulus*), Carps and Minnows, Creek Chub (*Semotilus atromaculatus*), and Longnose Dace (*Rhinichthys cataractae*) (Government of Ontario, 2022). However, the Cooksville Creek Characterization Report states no fish are present within Cooksville Creek north of the Queen Elizabeth Way due to fish barriers limiting movement upstream. Fish barriers are present at the rail crossing north of Lakeshore Road East, and at Atwater Avenue (Aquafor Beech, 2011). No fish were observed during NSE surveys and fish habitat is limited due to channel design. There may be potential for fish to be present during high-flow storm events. No aquatic SAR are known to be present.

Within the Study Area, upstream conditions (approximately within 100 m west of the Camilla Rd bridge) consist of a fractured bed and banks of an engineered trapezoidal concrete-lined channel. At the time of observation, the mean depth wetted was 8 cm, mean width wetted was 5.2 m, mean bankfull width was 11 m, and mean bankfull depth was 1.05 m. The substrate consisted entirely of concrete, there was no instream vegetation except for algae. Dominant riparian vegetation consisted of Willow species (*Salix spp.*) which provide stream shade cover of approximately 30-60%.

Downstream conditions (approximately within 100 m east of the Camilla Rd bridge) transitions from a concrete vertical wall to slumping and undermined gabion baskets up to three-tiers high. The substrate downstream of Camilla Rd bridge consisted of natural substrate. Bank stability ranged from stable to unstable. At the time of observation, the mean depth wetted ranged from 9 - 120 cm, the wetted width ranged from 6.4 to 10.5 m, the bankfull width ranged from 11 to 13 m, and the bankfull depth ranged from 1-2 m. The substrate consisted of boulders, cobble, gravel, and sand. Submergent vegetation included Algae. Non-native species included Japanese Knotweed (*Polygonum cuspidatum*) and European Buckthorn (*Rhamnus cathartica*). Dominant riparian vegetation consisted of Willow species,

Maple species (*Acer spp.*), and American Elm (*Ulmus americana*) which provided stream shade cover of 30-60%.

Site photos can be found within **Appendix 2**, and a copy of the Aquatic Habitat Assessment survey datasheets can be found in **Appendix 3**.

3.2 Terrestrial Resources Assessment

3.2.1 Ecological Land Classification

Ecological Land Classification data for the Camilla Natural Area was collected by NSE during previous fieldwork for the City of Mississauga's Natural Areas Survey. During the terrestrial field assessment on October 19, 2021, the classification was reviewed and confirmed for within the Study Area. The Study Area is classified as Fresh-Moist Ash Lowland Deciduous Forest Type (FOD7-2) and is described below.

Fresh-Moist Ash Lowland Deciduous Forest Type (FOD7-2)

A significant amount of dead and dying Ash (*Fraxinus spp.*) trees are present in the canopy. The live canopy is dominated by Manitoba Maple (*Acer negundo*), Crack Willow (*Salix fragilis*), American Elm (*Ulmus americana*), and Norway Maple (*Acer platanoides*) (25-60% cover, 10-25 m in height). Scattered mature willows are present along the creek banks. The sub-canopy contains an abundance of European Buckthorn, Manitoba Maple, and Ash species that cover more than 60% of the community and range from 2-10 m in height. The understory is dominated by European Buckthorn that covers 25-60% of the community and ranges from 1-2 m in height. The ground layer has European Buckthorn, Avens species (*Geum spp.*), and Erect Hedge-parsley (*Torilis japonica*). Ground layer vegetation is 0.5-1 m in height and covers more than 60% of the community.

3.2.2 Flora and Fauna Inventory

Flora

198 floral species have been observed within the Camilla Natural Area during NSE NAS surveys. The area has 90 non-native species representing 45% of the total species present. Of these, some are considered highly invasive, including Garlic Mustard (*Alliaria petiolata*), European Buckthorn (*Rhamnus cathartica*), Tartarian Honeysuckle (*Lonicera tartarica*), Japanese Knotweed (*Polygonum cuspidatum*), and European Common Reed (*Phragmites australis ssp. australis*).

One SAR has been noted within the Camilla Natural Area: Butternut (*Juglans cinerea*, Endangered). Butternut is also locally rare (known from 1 to 3 locations within the City of Mississauga). Four species are considered uncommon (known from 4 to 10 locations): Necklace Sedge (*Carex projecta*), Tall Blue Lettuce (*Lactuca biennis*), Clammy Ground-cherry (*Physalis heterophylla*) and American Mountain Ash (*Sorbus americana*). None of these are known to occur within the Study Area and none were observed during the field investigation.

No additional species were found in the Study Area that were not already known from the Camilla Natural Area surveys. The botanical inventory species list for the Camilla Natural Area (based on surveys conducted between 1995 and 2021) is included in **Appendix 4**.

Fauna

41 fauna species have been recorded within the Camilla Natural Area during NAS surveys. Of these, 37 are bird species, and four are mammal species.

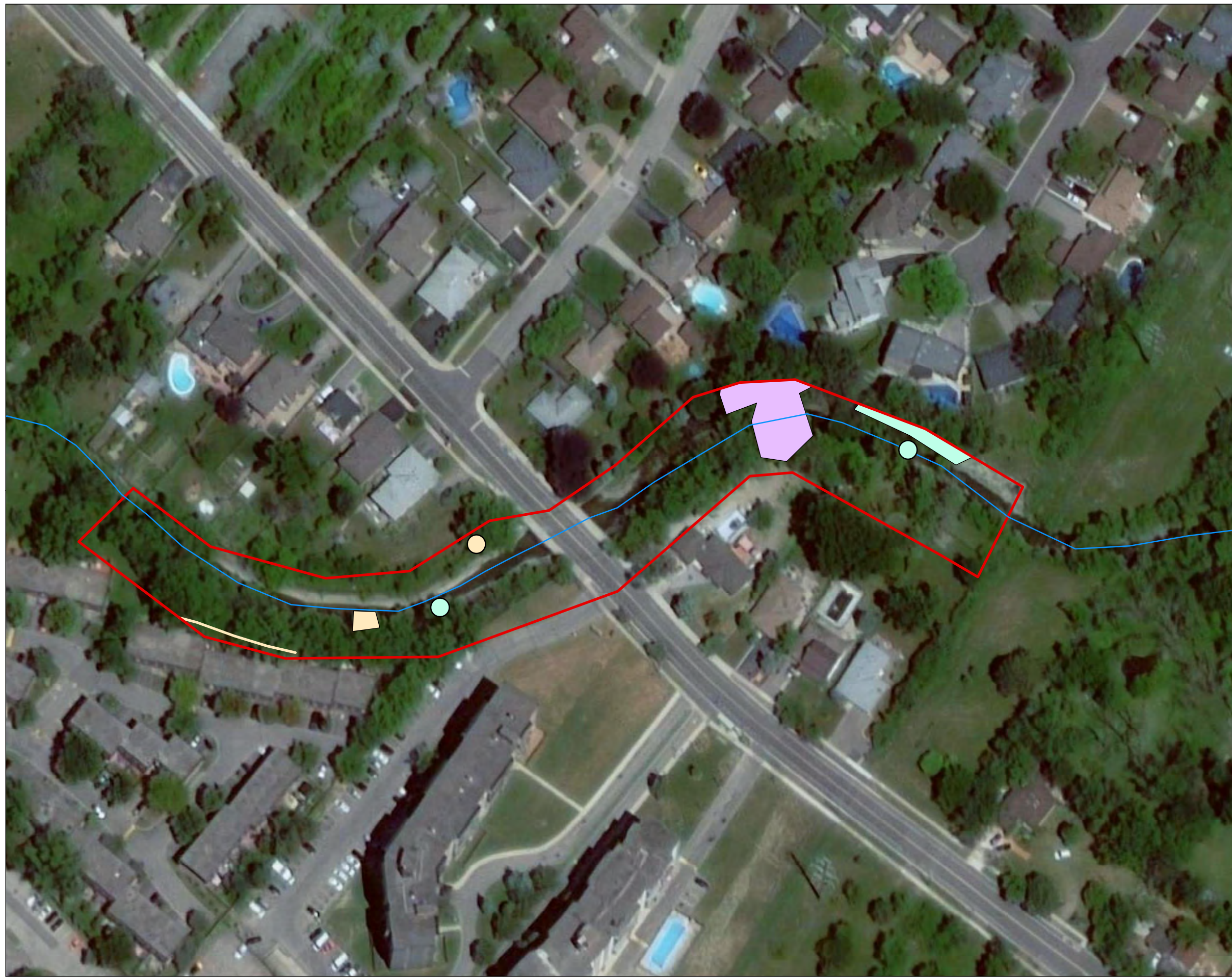
Three SAR have been noted within the Camilla Natural Area: Barn Swallow (*Hirundo rustica*, Threatened), Chimney Swift (*Chaetura pelagica*, Threatened) and Eastern Wood-pewee (*Contopus virens*, Special Concern). Additional discussion on these species is provided in **Sections 3.3** and **3.4**.

No additional species were found in the Study Area that were not already known from the Camilla Natural Area surveys. The wildlife inventory species list for the Camilla Natural Area (based on surveys conducted between 1995 and 2021) is included in **Appendix 4**.


3.2.3 Notable Trees


No significant trees (i.e., those with a diameter at breast height (dbh) > 150 cm) were identified within the Study Area. Locations of notable mature trees less than < 150 cm dbh (single trees and groups) were identified within the Study Area and are shown on **Figure 2**. These include mature maple and willow trees. These trees have some significance based on their maturity (ecological, aesthetic). The Freeman's Maple (*Acer x freemanii*) and Silver Maple (*Acer saccharinum*) are native trees that should be retained, if possible (though they do not receive protection under provincial or municipal legislation). The Crack Willow and Norway Maple (*Acer platanoides*), while mature trees, are non-native, and therefore a decision on retention should balance maturity, non-native status, and needs of the project design. These results should be considered preliminary. A detailed tree inventory will be conducted in 2022 within the area of work as informed by the selected design alternative.

Figure 2 | Cooksville Creek
Notable Trees




Legend


 Study Area

 Cooksville Creek

Tree Species

 Freeman's Maple (*Acer freemanii*)

 Silver Maple (*Acer saccharinum*)

 Crack Willow (*Salix x fragilis*), Norway maple (*Acer platanoides*)



Project Number
21-1238

Date:
2022-01-27



Map Produced by North South Environmental (NSE) Inc.
This map is proprietary and confidential and must not be duplicated or
distributed by any means without permission of NSE.
Data Provided by: North South Environmental Inc.
Imagery: ESRI



3.3 Significant Wildlife Habitat (SWH) Screening

Based on the presence of indicator species and vegetation communities, three types of candidate SWH were identified in the Study Area, described below. No confirmed SWH is known from the study area.

Seasonal Concentration Areas of Animals

Bat Maternity Colony (candidate): Deciduous trees are present and may include snag trees with suitable cavities or peeling bark. The potential presence of a bat maternity colony at this location cannot be determined without a snag density survey and potentially visual and / or acoustic surveys for bats. Mature trees (especially Maples and Oaks) within the Study Area are potential habitat. In the absence of targeted surveys, an assumption of potential presence and corresponding avoidance / mitigation is recommended.

Reptile Hibernaculum (candidate): Reptile hibernacula can be found in various habitats. The potential presence of a reptile hibernaculum at this location cannot be determined without spring or fall surveys to identify any congregations of snakes. Preferred habitat is not present (e.g., talus, rock crevices), and reptile hibernaculum habitat is uncommon on the landscape, so presence within the Study Area is considered unlikely.

Habitat for Species of Conservation Concern

Habitat for Special Concern and Rare Wildlife Species (candidate): One Special Concern species have been observed in the Camilla Natural Area and may use the Study Area: Eastern Wood-pewee. In addition, four Special Concern or provincially rare species (S1-S3) have been identified as having moderate to high potential to use the Study Area: Snapping Turtle (*Chelydra serpentina*), Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), and Northern Long-eared Myotis (*Myotis septentrionalis*). In the absence of targeted surveys, an assumption of potential presence and corresponding avoidance / mitigation is recommended.

3.4 Species at Risk (SAR) Screening

No SAR have been confirmed within the Study Area, though four SAR have been found in the Camilla Natural Area (which includes the Study Area). Species that have moderate to high potential to occur in the Study Area are: Butternut (*Juglans cinerea*), Midland Painted Turtle (*Chrysemys picta marginata*), Snapping Turtle, Barn Swallow, Eastern Wood-pewee, Small-footed Bat, Little Brown Myotis, Northern Long-eared Myotis.

Butternut: None were observed in the study area, though suitable habitat is present. Two trees are known from Camilla Natural Area, outside of the study area. Additional searches will be conducted during arborist surveys in 2022 within the area of work as informed by the selected design alternative. As an Endangered species under the ESA, Butternut receives species and habitat protection.

Midland Painted Turtle, Snapping Turtle: None were observed in the study area, and only marginal habitat is present due to the level of channel disturbance. In addition, there are aquatic barriers to movement along Cooksville Creek and barriers to terrestrial movement due to urban conditions. However, there is moderate potential for these species to be present as they are common within the region, and potential habitat is present. If these species do use the study area, it is expected that use would not include overwintering (insufficient water depth) or nesting (no suitable nesting sites). Midland Painted Turtle has been assessed as Special Concern federally by COSEWIC but does not receive protection under SARA or ESA. It also does not receive protection under Significant Wildlife Habitat policies as it is not a species of Special Concern provincially, and it is not provincially rare. Snapping Turtle is listed as Special Concern under SARA and ESA. It does not receive protection under these Acts but does receive protection under Significant Wildlife Habitat policies. Effort to protect these species and their habitat through mitigation should be undertaken.

Barn Swallow: Barn Swallow has been recorded within Camilla Natural Area, and there is potential for it to forage within the study area. There is also potential for it to nest on structures within the study area (i.e., Camilla Road bridge). Barn Swallow is listed as Threatened under SARA and the ESA. With respect to the study area, Barn Swallow and its habitat receive protection under the ESA.

Eastern Wood-pewee: Eastern Wood-pewee has been recorded within Camilla Natural Area. There is potential for it to nest within the forest of the study area. Eastern Wood-pewee is listed as Special Concern under SARA and the ESA. It does not receive protection under these Acts but does receive protection under Significant Wildlife Habitat policies. Effort to protect this species and their habitat through mitigation should be undertaken.

Small-footed Bat, Little Brown Myotis, Northern Long-eared Myotis: These species have not been recorded in the study area; however, they are known to be present in Mississauga. Confirmation of presence generally requires acoustic surveys. All three of these bat species are Endangered under the ESA. Little Brown Myotis and Northern Long-eared Myotis are also Endangered under SARA. With respect to the study area, these species and their habitat receive protection under the ESA. There is potential for these species to roost on trees within the forest, and to forage within the study area.

The SAR screening table can be found in **Appendix 5**.

4.0 Policy Considerations and Key Sensitivities

The following key sensitivities are present within the Study Area, with reference to their governing policy or legislation.

- **Species at Risk Habitat:** While there is no confirmed SAR habitat within the Study Area, SAR are known from Camilla Natural Area. There is potential for SAR to be present within the Study Area, especially SAR birds, turtles, and bats. Endangered and Threatened SAR species and their habitat are regulated under the Ontario's *Endangered Species Act*. Special Concern species and their habitat are regulated per the *Provincial Policy Statement* as implemented by municipal Official Plans. Mitigation recommendations to avoid potential impact to SAR are presented in the following section.
- **Fish Habitat:** Cooksville Creek provides fish habitat and is therefore regulated by DFO under the federal *Fisheries Act* (though habitat is believed to be limited within the study area). As the proposed works are anticipated to involve in-water works that have the potential to harm fish or fish habitat, a Request for Review from DFO will be required.
- **Significant Woodlands:** Woodland is present within the Study Area and meets criteria in the City of Mississauga Official Plan for 'significant woodland' (i.e., is > 0.5ha in size and located within 30 m of a watercourse). Significant woodlands automatically meet criteria as Significant Natural Areas. Development and site alteration policy for Significant Woodland is shown below under 'Significant Natural Area.' All treed portions of the Study Area meet criteria as significant woodland.
- **Conservation Authority Regulated Lands:** The Study Area is within a Credit Valley Conservation (CVC) regulated area, pursuant to O. Reg. 160/06. A permit from CVC will be required.
- **Hazard Lands:** The Study Area includes a watercourse and floodplain and is mapped as Hazard Land on Schedule 3 of the City of Mississauga Official Plan. A permit from CVC will be required.
- **Significant Wildlife Habitat:** No confirmed SWH is known from the study area. Three SWH types have been identified as having potential to occur within the Study Area (bat maternity colony, reptile hibernaculum, habitat for Special Concern or Rare species). As per Policy 2.1.5 of the PPS (2020), development and site alteration are not permitted within SWH unless it can be demonstrated that there will be no negative impact to those features.
- **Significant Natural Area:** Camilla Natural Area (CV8) is classified as a Significant Natural Area per the City of Mississauga's Natural Areas Survey. Significant Natural Areas and their buffers are designated as Greenlands under the City of Mississauga's Official Plan. Uses are limited to conservation, flood and/or erosion control, essential infrastructure, and passive recreation. Development and site alteration within or adjacent to Significant Natural Areas will not be permitted unless all reasonable alternatives have been considered and any negative impacts

have been minimized. Any negative impact that cannot be avoided must be mitigated through restoration and enhancement to the greatest extent possible, as demonstrated in an EA or EIS.

5.0 Preliminary Impact Assessment and Recommended Mitigation

The proposed activities have the potential to impact species, habitats, and designated features. These potential impacts are itemized below, along with their corresponding mitigation measures that are recommended to be implemented through project design, and / or construction. At this time, the assessment of impacts should be considered preliminary. The impact assessment presented here will be confirmed and, where appropriate supplemented (e.g., impacted trees) upon selection of the preferred design.

5.1 Surface Water

Impact Assessment

Construction could lead to a short-term increase in sediment inputs into the creek if erosion and sediment control (ESC) measures are not implemented during construction. In addition, there is potential for fuel spills and spillage of related substances during construction.

Mitigation

- **Erosion and Sediment Control Measures:** ESC measures should be used as required during construction. ESC measures may include silt fencing, flow checks (e.g., fibre filtration tubes) and surface treatments to protect soil on slopes until vegetation has re-established. Netted erosion control blankets and other netted materials should not be used because they can pose an entanglement risk to snakes and other wildlife. All exposed soil should be reseeded as soon as possible after construction.
- **Fuel and Related Substance Control Measures:** Handling of potentially harmful substances (e.g., fuels, oils, etc.) should be conducted at least 30 m away from the watercourse. A spill kit should be accessible anywhere where deleterious substances are stored or handled.

5.2 Fish and Fish Habitat

Impact Assessment

In-water work will be required in order to complete the proposed restoration and stabilization works. In-water work can harm fish directly (i.e., by construction equipment) and indirectly (e.g., by alterations to their spawning, foraging and/or sheltering habitats).

Mitigation

In addition to the mitigation measures described under Surface Water (above):

- **Fish Exclusion Measures:** In order to prevent harm to fish, in-water work areas should be isolated during construction using pea gravel bags wrapped in impermeable plastic. Fish will be removed from isolated areas by a qualified fisheries biologist and relocated to the watercourse at least 50 m downstream of the work area. Dewatering pump intakes will have screens in place to prevent entrapment of fish during dewatering. Fish passage will be maintained within Cooksville Creek at all times.
- **Timing window:** Works should occur outside of the timing windows for warmwater fish spring spawning (March 15 to July 15). Timing should be verified with CVC in advance of works.
- **DFO Review:** A Request for Review (RFR) from the DFO is required as the proposed works could harm fish and fish habitat. If the review identifies that the death of fish and / or harmful alteration, disruption or destruction of fish habitat will likely result from the project, a DFO Authorization under the *Fisheries Act* will be required.

5.3 Significant Woodland

Impact Assessment

Construction activities may require tree removals and may cause harm to retained trees. Trees provide erosion control / bank stabilization, provide habitat for terrestrial species, and provide shade for aquatic species. All treed areas within the study area meet City of Mississauga criteria for significant woodland. Significant woodlands are also designated as Significant Natural Areas per the City of Mississauga's Official Plan. Development and site alteration within or adjacent to Significant Natural Areas is not permitted unless all reasonable alternatives have been considered and any negative impacts have been minimized. Any negative impact that cannot be avoided must be mitigated through restoration and enhancement to the greatest extent possible.

Mitigation

Tree removals should be limited. Where tree removals cannot be avoided, the design should show preference to the retention of mature, native, healthy trees. The tree inventory, arborist report, and tree protection plan will inform the detailed design. The City of Mississauga's Tree Preservation and Protection Standards, and Forestry Protective Hoarding Guidelines shall be implemented.

5.4 Significant Wildlife Habitat

Impact Assessment

While significant wildlife habitat has not been confirmed within the study area, there is potential for habitat to be present (i.e., candidate significant wildlife habitat), as discussed in **Section 3.3**. Significant wildlife habitat is protected under the PPS.

Mitigation

Tree removals should be limited and conducted outside of the breeding bird and active bat seasons (generally April 1 to September 30). Construction is recommended to occur outside of the times when snakes are congregating at hibernacula (generally October through April). If construction must occur during these times and if concentrations of snakes are noted that could indicate an active reptile hibernaculum, work that could impact the habitat should cease and the contract administrator or environmental inspector contacted for guidance. Please see additional mitigation measures in **Sections 5.5** and **5.6**.

5.5 Species at Risk Habitat

Impact Assessment

No SAR are known to occur within the Study Area, however there is moderate to high potential for SAR birds, turtles, and bats to present. SAR and their habitat are protected under SARA, ESA, and the municipal Official Plans.

Mitigation

- **SAR birds:** Barn Swallow receives species and habitat protection under the ESA. Eastern Wood-pewee does not receive protection under the ESA, but its habitat is protected under Significant Wildlife Habitat policies. Timing windows for vegetation clearing are recommended to occur outside of the nesting bird season, or alternatively, due diligence nest searches should occur, where necessary (as described below under nesting birds, **Section 5.5**).
- **SAR turtles:** Midland Painted Turtle and Snapping Turtle do not receive protection under the ESA, but their habitat is protected under Significant Wildlife Habitat policies. SAR turtles may use Cooksville Creek for life processes and may also use near-bank areas as nesting habitat (though no suitable nesting habitat is believed to be present). In-water works are recommended to occur outside of the turtle hibernation season (October 31- April 15). For land-based works, exclusionary fencing is recommended to be installed around the work area to prevent turtles from entering the construction zone. If a SAR turtle enters the work zone it should be permitted to leave on its own, or if that is not possible, the environmental inspector or contract administrator should be contacted for guidance. Active nests must be protected. If that is not possible, the environmental inspector or contract administrator should be contacted for guidance. Consultation with MECP may be required.
- **SAR bats:** Small-footed Bat, Little Brown Myotis, and Northern Long-eared Myotis receive species and protection under the ESA. Timing windows for tree clearing are recommended to avoid potential impacts to maternity or day roosts of SAR bats. Tree clearing is recommended to occur outside of the active bat season (April 1 - September 30). If tree clearing must occur between April 1 and September 30, MECP recommends bat habitat assessments (maternity roost surveys and acoustic surveys) to support compliance with the ESA.

- **SAR in general:** Should a SAR species be identified within or near the work site with potential to be impacted by the works, all work must cease, and the environmental inspector or contract administrator should be contacted for guidance. Consultation with MECP may be required.

5.5 Nesting Birds

Impact Assessment

Vegetation clearing could result in the harm, harassment, or killing of migratory birds that receive protection under the *Migratory Birds Convention Act* (MBCA) and its Regulations. The MBCA protects adults, their young, and their nests.

Mitigation

Vegetation clearing should occur outside of the typical nesting bird season (April 1 - August 31) to avoid contravention of the MBCA and its Regulations. If vegetation removal must occur during the breeding bird season, a due diligence nest search should be conducted by a qualified biologist. If active bird nests are found on site at any time (including outside of the typical nesting season), the area around the nest should be isolated and all activity within the nesting area should cease until the young birds have fledged or the nest is abandoned.

5.7 Spread of Invasive Species

Impact Assessment

Highly invasive species are present within the Study Area (e.g., European Buckthorn, Tartarian Honeysuckle, Japanese Knotweed, European Common Reed). Construction activities have the potential to spread invasive species by transporting seeds or vegetative material capable of regeneration to new locations. Invasive species can be spread via the intentional removal of 'waste' vegetation from the construction area to an on-site or off-site location; the unintentional removal of 'waste' vegetation from one location to another on equipment (such as muddy tires) or via other means (e.g., seeds and vegetative material entering an adjacent watercourse).

Mitigation

The Clean Equipment Protocol for Industry (Halloran et al., 2016) should be followed to limit the spread of invasive species. Invasive species that are removed during construction should be disposed of off-site in a landfill or buried at an appropriate depth on-site. Vegetative waste should not be permitted to enter Cooksville Creek.

5.8 Timing Window Summary

A summary of timing windows when species are active is provided below. These windows are approximate as activity fluctuates from year-to-year based on weather conditions and other variables.

Protected species, and species engaged in protected activities, are protected even if encountered outside of these timing windows.

Species Group	Sensitive Period	Considerations for Construction
Bats (roosting)	April 1 - September 30	Tree removal should occur outside of the sensitive period.
Birds (nesting)	April 1 - August 31	Vegetation removal (trees, shrubs, ground layer) should occur outside of the nesting period. Compliance with Migratory Birds Convention Act is required.
Fish (spawning)	Warmwater: March 15 to July 15	Construction Timing Window: July 16 - March 14 In-water works are to occur within the construction timing window.
Turtles (hibernation)	October 31 - April 15	Works should not occur during this period where hibernation may occur. Species are highly vulnerable during this period.
Snakes (hibernation)	October 31 - April 15	Works should not occur during this period where known or potential hibernacula occur. Species are highly vulnerable during this period.

It is recommended that all vegetation clearing occur outside of active period(s) for bats and birds (i.e. vegetation clearing should be conducted between October 1 and March 31). All in-water works should occur between July 16 and March 14. Based on site conditions, it is not anticipated that turtle overwintering habitat is present. Similarly, while there is some potential for snake hibernacula to be present, it is considered unlikely.

6.0 Opportunities for Enhancement and Restoration

6.1 Channel Design

Channel design features such as meanders, sloped banks, and a natural substrate will improve the hydrological function of Cooksville Creek and enhance wildlife habitat.

- Meanders - There may be an opportunity to incorporate small meanders and associated pools and riffles into the channel design, though this requires engineer review in consideration of valley topography, width of the easement, fluvial geomorphology constraints and hydraulic requirements. Meanders slow the flow of water which reduces the erosional force of the watercourse, create heterogenous vegetation zones, and increase the length of the watercourse

which provides increased habitat. Prior to extensive urbanization and development, Cooksville Creek exhibited a meandering form (Aquafor Beech, 2011).

- Sloped bank - The reach of Cooksville Creek upstream of Camilla bridge and within the Study Area utilizes gabion baskets and steep (~40°) concrete sloped walls to control erosion. This design limits the vegetated littoral zone and makes it difficult for wildlife to enter / exit or otherwise access (i.e., to drink) the watercourse. Utilizing a gentle slope along the watercourse would increase the size of the littoral zone, create various depths to support a more heterogenous vegetation community, and improve wildlife use. This would be particularly helpful in permitting SAR turtles, if present, to access nesting sites. The feasibility of creating gently sloped banks requires engineer review in consideration of valley topography, width of easement, and erosion concerns.
- Natural substrate - Naturalization of the substrate via removal of the existing concrete bed will create habitat for aquatic species (both plants and animals). This is especially important to improving fish habitat.
- Integration of plantings, habitat, and bioengineered elements - softening of the bed and banks and adding plantings of native species, where technically feasible, can introduce diversity and improve overall habitat conditions, including potential shading of the watercourse to improve thermal conditions. Habitat elements may be integrated pending the overall design opportunities (e.g., root wads) to improve in-stream and riparian habitat conditions. Use of bioengineered elements to manage erosion concerns will improve the overall condition of the watercourse and improve overall function for wildlife and aquatic habitat.

6.2 Invasive Species Management

The Study Area is highly impacted by invasive species. During the construction phase it is anticipated that some vegetation clearing will be required. This presents an opportunity to remove invasive species. Invasive species should be disposed of carefully to avoid spreading them into uncontaminated areas. Invasive species should be disposed of in a landfill or buried on site at an appropriate depth. The Ontario Invasive Plant Council provides a series of free Best Management Practices guides (OIPC, 2022) for managing and disposing of invasive species.

Invasive species known to occur in the Camilla Natural Area and potentially within the Study Area include: European Buckthorn, Norway Maple, Japanese Knotweed, Common Reed, Purple Loosestrife, Reed Canary Grass, Tartarian Honeysuckle, Multiflora Rose, and Garlic Mustard.

6.3 Restoration Plantings / Seeding

It is anticipated that vegetation clearing will be required during construction. This presents an opportunity to restore the cleared area via plantings and seedings. As the site is within a CVC regulated area, CVC mandates the use of native species that are common within its jurisdiction for planting plans. CVC's Plant Selection Guideline (CVC, 2018) contains recommended species for restoration plantings and seed mixes. Tree plantings and restoration seeding will help stabilize the soil and promote infiltration. Over time, as the trees become established and grow, they will provide shade to Cooksville Creek and reduce high temperatures stressful to aquatic species.

6.4 Garbage Cleanup

Near-shore and in-water works are anticipated during channel restoration. This presents an opportunity to remove garbage (especially larger items if present). Removing garbage improves water quality and aesthetics. In addition, it removes barriers to species movement, especially movement of fish and turtles.

7.0 Conclusions and Next Steps

Information provided in this Natural Environment Technical Memo supports EA documentation requirements and informs the design and natural environment elements and opportunities.

Next Steps

1. NSE will provide input to the evaluation of alternatives, upon request by Resilient.
2. NSE will provide a brief summary of scoped natural environment impacts after the preferred alternative has been selected.
3. A Tree Inventory, Arborist Report & Tree Preservation Plan will be conducted by NSE in 2022 at the detailed design stage.
4. NSE will review / provide input to ecological / natural heritage details on the detailed design. In addition, NSE will provide recommended species / review species for a restoration plan and mark-up design drawing(s) with restoration recommendations.
5. At the detailed design stage, NSE will prepare and submit an RFR to DFO, and address comments received in consultation with / with input from Resilient, as appropriate.

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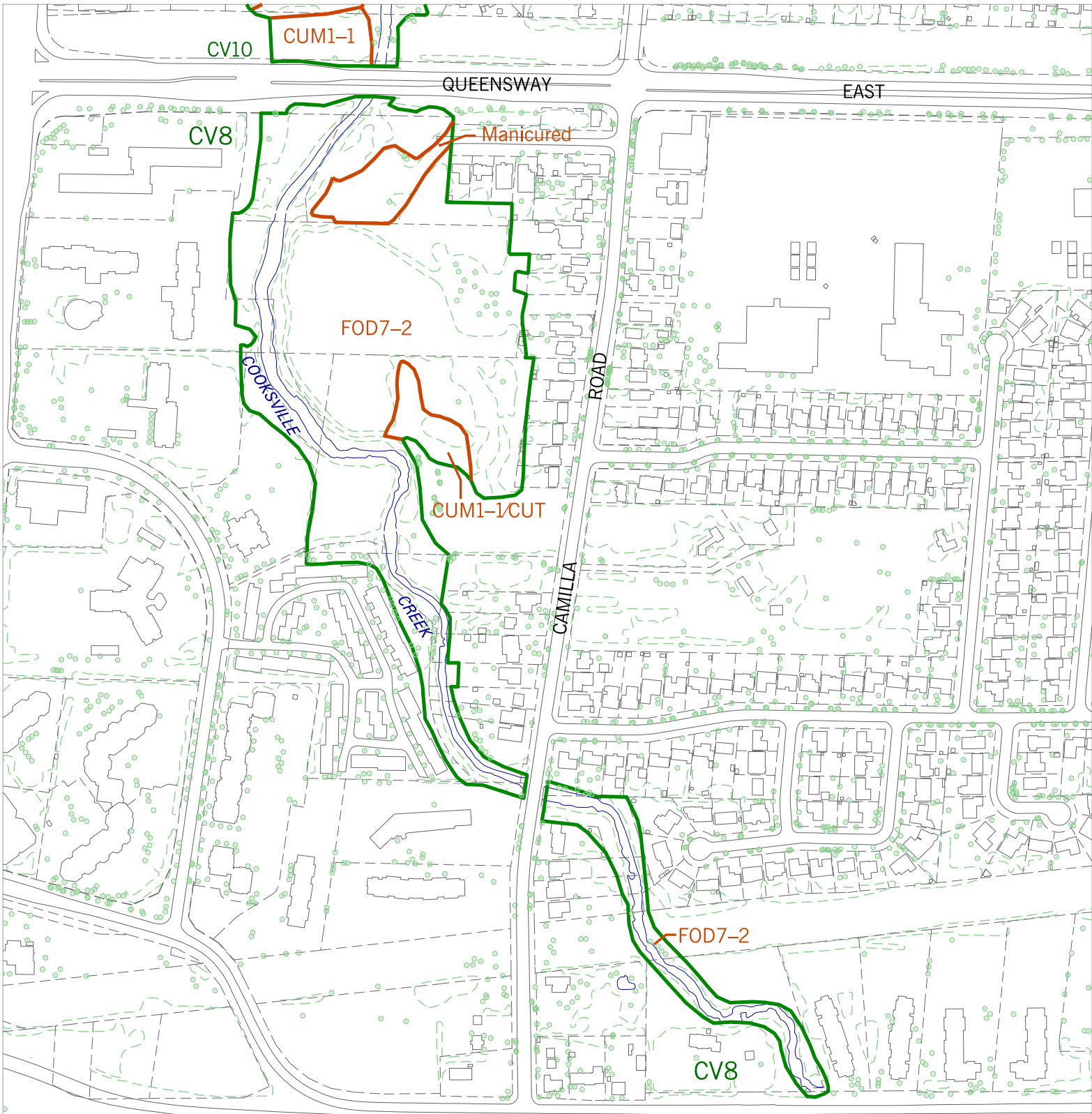
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Appendix 1. Natural Areas Survey Report and Map: Camilla Natural Area



Natural Areas System

2020 NATURAL AREAS UPDATE

SITE CV8

NATURAL AREAS SYSTEM CLASSIFICATION

- NATURAL AREAS
- VEGETATION COMMUNITIES
- - - SPECIAL MANAGEMENT AREAS
- . - . LINKAGES



CV8

CLASSIFICATION Significant Natural Area	Park Name Camilla Park	PLANNING DISTRICT Cooksville	AREA (Ha) 8.95
CONSERVATION AUTHORITY CVC	SUBWATERSHED Cooksville Creek	OWNERSHIP Private/City	SURROUNDING LAND USE Residential

GENERAL SUMMARY

CV8 is located immediately south of the Queensway East continuing south along Cooksville Creek to the Queen Elizabeth Way. Throughout its length Cooksville Creek links a number of natural areas, including CC1, CV10, and LV4. The natural area CV2 is located approximately 500 m to the west.

PHYSICAL DESCRIPTION

The topography of this site is level. Bedrock geology consists of the grey shales of the Georgian Bay Formation. These are overlain by up to 7.5 m of soils and glacial deposits consisting of well drained Fox sand that has developed within Lake Iroquois shallow water deposits. Soil moisture is mesic throughout this site. Portions of Cooksville Creek are engineered within the site.

CONDITION

This site is currently in poor condition. Disturbances are prevalent and include extensive unplanned trails, soil compaction, garbage, evidence of fire pits, and noise. High water levels in 2017 have led to a large amount of sedimentation on the creek banks and vegetation was water-swept. Cooksville Creek is channelized in portions of this site with concrete and armour stone. Extensive rehabilitation of the creek was undertaken between 2000 and 2005 to reduce the frequent and intense flood events resulting from inappropriate stormwater practices in upstream developments. Invasive plant species are prevalent and include Garlic Mustard, Tartarian Honeysuckle, Japanese Knotweed (*Polygonum cuspidatum*) and European Buckthorn. Ninety introduced plant species are present at this site (representing 45.45% of the total number of species present) a very high value. Surrounding land use is residential.

ECOLOGICAL LAND CLASSIFICATION

Number of Plant Communities

Three vegetation communities are present at this site (see accompanying figure): dry-moist old field meadow type/mineral cultural thicket type (CUM1-1/CUT1), fresh-moist ash lowland deciduous forest type (FOD7-2), and manicured.

Significant Plant Communities

There are no Significant Plant Communities in CV8.

SPECIES RICHNESS

Flora

The native FQI of 32.52 and the native mean coefficient of 3.13 (a low value). The native FQI has increased from the previous value of 30.41, and the native mean coefficient has decreased from previous value of 3.17, respectively.

There are 198 floral species documented for this site.

1 provincially significant flora species has been noted; an Endangered species known as Butternut (*Juglans cinerea*).

5 locally significant flora species have been noted on site; 1 rare species (known from 1 to 3 locations), and 4 uncommon species (known from 4 to 10 locations).

26 Credit Valley Conservation flora Species of Conservation Concern (Tier 1-3).

Fauna

From the perspective of wildlife habitat, this site has a non-linear configuration with many openings, which creates a low interior-to-edge

ratio. The diversity of possible breeding bird species was moderate. The most common species were those adapted to small patches of mainly successional habitat, tolerant of urban conditions, such as European Starling (a non-native species that nests on buildings and trees), Song Sparrow and American Goldfinch. A few Red-winged Blackbirds were noted along the creek. Brown Thrasher, Gray Catbird, and Common Grackle have been noted at the site and are dependent on mid-successional vegetation (thickets and young woodlands) for nesting habitat. Two species common in the City's urban woodlands, Northern Flicker and Great Crested Flycatcher, have been documented from the site. Hairy Woodpecker, White-breasted Nuthatch, and Eastern Woodpecker were also noted on site; species that require mature woodlands. Blue-grey Gnatcatcher has been documented from the site. This bird inhabits a range of woodlands from early successional to mature woodlands. A total of 36 birds and 4 mammals were documented at this site. Cooksville Creek is classified as a type 2 fishery within this site.

There are 40 faunal species documented for this site.

2 provincially significant fauna species; both Threatened.

15 Credit Valley Conservation fauna Species of Conservation Concern (Tier 1-3).

MANAGEMENT RECOMMENDATIONS

1. The City park, Camilla, is included within this natural area.
2. Continued monitoring of Cooksville Creek to ensure the frequency and intensity of flooding events is reduced. Continue rehabilitation and adaptive management if needed.

REFERENCES

Gore & Storrie Limited and R.E. Winter & Associates Limited (1994)

ECOLOGICAL LAND CLASSIFICATION

Dry-Moist Old Field Meadow Type/Mineral Cultural Thicket Type (CUM1-1/CUT1)

The meadow/thicket complex has a patchy canopy (10-25% cover) of Freeman's Maple (*Acer x freemanii*), Manitoba Maple (*Acer Negundo*) and Poplar species (*Populus spp.*). The canopy is 2-10 m in height. The sub-canopy is dominated by European Buckthorn (*Rhamnus cathartica*) (25-60% cover and 1-2 in height). The understory is dominated by Reed Canary Grass (*Phalaris arundinacea*), greater than 60% cover), and 0.5-1 m in height. Wild Carrot (*Daucus carota*) and Ground-ivy (*Glechoma hederacea*) are abundant in the ground layer. The ground layer vegetation is 0.2-0.5 m in height and covers 10-25% of the community.

Fresh-Moist Ash Lowland Deciduous Forest Type (FOD7)

This community contains a significant amount of dead ash species in the canopy. Crack Willow (*Salix fragilis*), Manitoba Maple (*Acer negundo*), American Elm (*Ulmus americana*) and Norway Maple (*Acer platanoides*) form the live canopy (25-60% cover, 10-25 m in height) along the floodplain. Scattered mature willows are present along to the creek banks. The sub-canopy and understory both contain an abundance of European Buckthorn, Manitoba Maple and Ash species that cover more than 60% of the community and range from 2-10 m in height. The understory is dominated by European Buckthorn (25-60% cover, 1-2 m in height). The ground layer has European Buckthorn, Geum species (*Geum spp.*) and Erect Hedge-parsley (*Torilis japonica*). Ground layer vegetation is 0.5-1 m in height and covers more than 60% community.

Manicured

The manicured area has a playground and a gravel trail connecting the residential areas on either side of the site.

Appendix 2. Site Photos



Engineering trapezoidal concrete-lined channel



Fractured banks of trapezoidal concrete-lined channel



Camilla Rd. bridge culvert



Bank erosion and failing gabion baskets

Appendix 3. Aquatic Habitat Assessment Data Sheets

US1

GENERAL INFORMATION										
PROJECT #: 21-1238		PROJECT DESCRIPTION: Cooksville			DAY: 19	MONTH: 10	YEAR: 2021			
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown										
COLLECTORS: PC, DB		WEATHER CONDITIONS: clear			TIME STARTED: 9:40		TIME FINISHED: 12:40			
AIR TEMP: 16			WATER TEMP: 11			CONDUCTIVITY (µS/cm):				
PHOTO NUMBERS AND DESCRIPTIONS:										
LOCATION										
NAME OF WATERBODY: Cooksville Creek		DRAINAGE SYSTEM: Lake Ontario			CROSSING #: N/A		STATION #: N/A			
LOCATION OF CROSSING: Camilla Rd, Mississauga, Ontario.										
GPS COORDINATES: 43.57347 ⁰⁰ , 79.598431 ⁰⁰					MTO CHAINAGE: N/A					
TOWNSHIP: Peel Region					MNR DISTRICT: Aurora					
LAND USE AND POLLUTION										
SURROUNDING LAND USE: residential					SOURCES OF POLLUTION: dumping stormwater outlet upstream					
EXISTING STRUCTURE TYPE										
Bridge <input checked="" type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>		
Other <input type="radio"/> Describe:						Size (w x h) m ²				
SECTION TYPE AND MORPHOLOGY										
SECTION IDENTIFIER: US-S1				SECTION LOCATION: (include on habitat map) 43.573740 ⁰⁰ 79.598644 ⁰⁰						
TYPE: Stream / river <input checked="" type="checkbox"/>		Channelized <input checked="" type="checkbox"/>		Permanent <input checked="" type="checkbox"/>		Intermittent <input type="checkbox"/>		Ephemeral <input type="checkbox"/>		ASSOCIATED WETLAND: N/A
TOTAL SECTION LENGTH (m): 50m					CURRENT VELOCITY (m/s): N/A					
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other				
Percentage of area	/	/	/	/	/	100%				
Mean depth wetted (m)	/	/	/	/	/	10 cm				
Mean width wetted (m)	/	/	/	/	/	5.4 m				
Mean bankfull width (m)	/	/	/	/	/	11 m				
Mean bankfull depth (m)	/	/	/	/	/	105 cm				
Substrate	/	/	/	/	/	Cement 100%				
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D		

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	0	<input checked="" type="checkbox"/>	0	0			
Right Upstream Bank	0	<input checked="" type="checkbox"/>	0	0			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5%	0%	0%	Instream 0% Overhanging 0%	0%	Instream 70% (algae) Overhanging	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None		
	0	0	<input checked="" type="checkbox"/>	0	0		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
	60		0		5		
Predominant Species	algae				Reed canary grass purple loosestrife		
MIGRATORY OBSTRUCTIONS:	<input checked="" type="checkbox"/> None		Seasonal		Permanent		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning None		Evidence of Groundwater None		Other NONE.		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<ul style="list-style-type: none"> - Naturalization - plant native species - stabilization - removal of non-native species - provide fish habitat - instream vegetation. 							
COMMENTS:							
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____							

SECTION IDENTIFIER: US-S1	SECTION LOCATION: 43,573740°N, 79.98044°W	SECTION LENGTH (m): 50m	SCALE (cm / m): 1/2
			PROJECT #: 21-1238
			MAPPER: DB
			NAME OF WATERBODY: Cooksville Creek
			CROSSING #: N/A.
			STATION #: US1
			DATE: DD-MMM-YY 19/10/21
LEGEND			
<p>10d depth (cm) 6w width</p> <p>➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree AAA Dam/Weir/Obstruction ⊗ Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line └┘ Culvert</p>			
PROFILE:	Horz. Scale	Vert. Scale	

US2

Ministry of Transportation
Environmental Guide for Fish and Fish Habitat

Section 4: Field Investigations
Appendix 4.A: Watercourse Field Record Form

GENERAL INFORMATION									
PROJECT #: 21-1238		PROJECT DESCRIPTION: Cooksville			DAY: 19	MONTH: 10	YEAR: 2021		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown									
COLLECTORS: DB, PC		WEATHER CONDITIONS: Clear skies, 0 wind, no precip			TIME STARTED: 9:50		TIME FINISHED: 12:40		
AIR TEMP: 9°C			WATER TEMP: 11°C			CONDUCTIVITY (µS/cm): N/A			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Cooksville Creek		DRAINAGE SYSTEM: Lake Ontario			CROSSING #: N/A		STATION #: N/A		
LOCATION OF CROSSING: Camilla Rd, Mississauga, Ontario									
GPS COORDINATES: 43.57347°N, 79.598431°W					MTO CHAINAGE: N/A				
TOWNSHIP: Peel Region					MNR DISTRICT: Aurora				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Residential / Recreational					SOURCES OF POLLUTION: Storm water drainage outlets, dumping / yard waste, garbage				
EXISTING STRUCTURE TYPE									
Bridge <input checked="" type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:							Size (w x h) m ²		
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: U/S-S2				SECTION LOCATION: U/S of bridge at Camilla Rd. 43.573565°N, 79.599305°W (include on habitat map)					
TYPE: Stream / river <input checked="" type="radio"/>		Channelized <input checked="" type="radio"/>		Permanent <input checked="" type="radio"/>		Intermittent <input type="radio"/>		Ephemeral <input type="radio"/>	
								ASSOCIATED WETLAND: N/A	
TOTAL SECTION LENGTH (m): 50m					CURRENT VELOCITY (m/s): N/A				
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other			
Percentage of area	/	/	/	/	/	Manmade Res Channel			
Mean depth wetted (m)	/	/	/	/	/	6			
Mean width wetted (m)	/	/	/	/	/	5m			
Mean bankfull width (m)	/	/	/	/	/	11			
Mean bankfull depth (m)	/	/	/	/	/	105cm			
Substrate	/	/	/	/	/	100% cement			
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY							
		Stable	Slightly Unstable	Moderately Unstable	Unstable		
Left Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Right Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	0%	0%	0%	Instream 2% Overhanging 2%	0%	Instream 70% (algae) Overhanging 1% (grass sp)	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60-30%	30 - 1%	None		
	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	algae.		N/A		Grass sp		
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning None		Evidence of Groundwater None		Other None.		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
Remove hardscape and naturalize/stabilize bank							
COMMENTS:							
Riparian dominant vegetation - Hybrid willow							
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____							

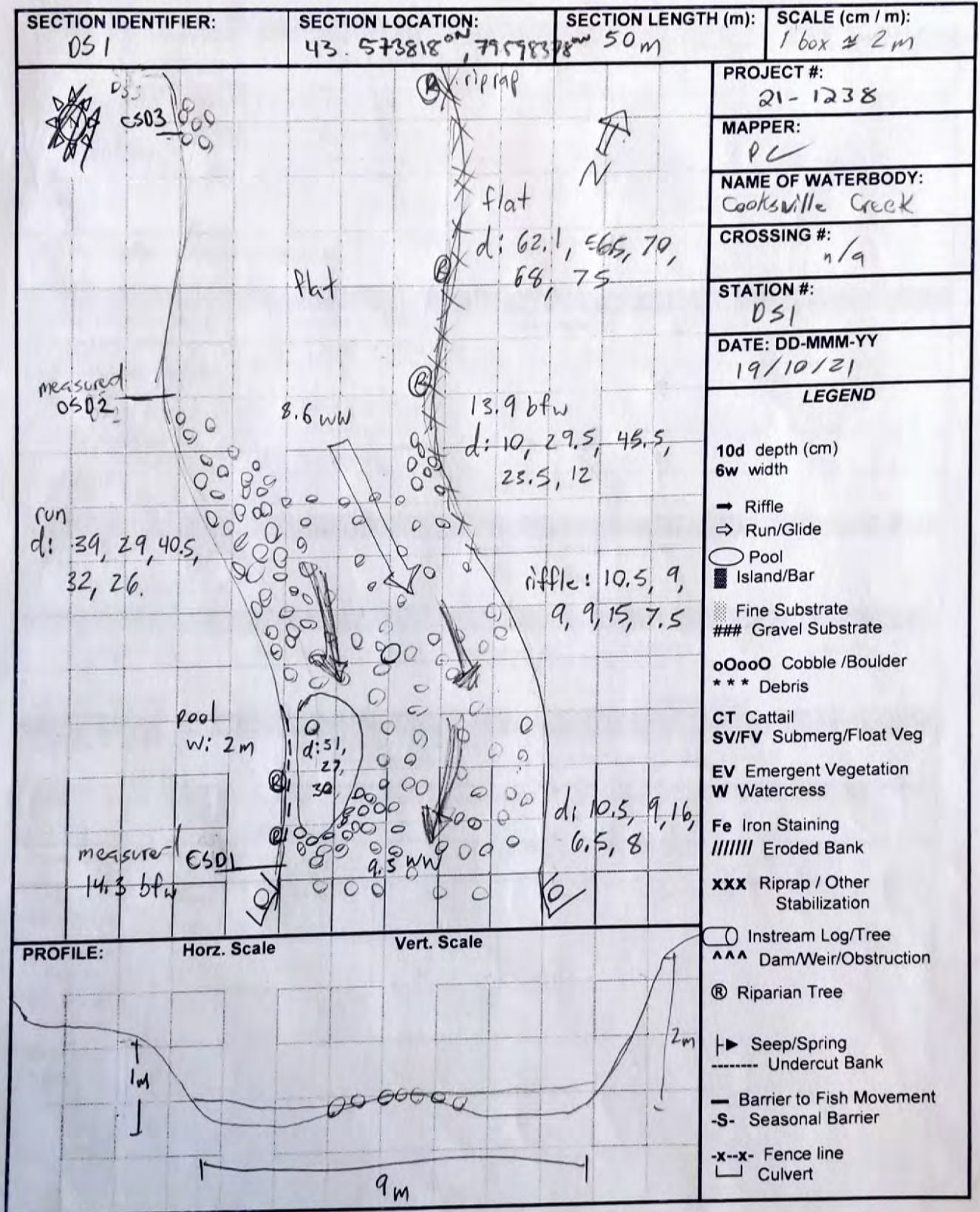
SECTION IDENTIFIER: US 2	SECTION LOCATION: 45.573565°N, 79.579305°W	SECTION LENGTH (m): 50.0	SCALE (cm / m): 1/2
			PROJECT #: 21-1238
			MAPPER: DB
			NAME OF WATERBODY: Cooksville Creek
			CROSSING #: n/a
			STATION #: US 2
			DATE: DD-MMM-YY 19/10/21
LEGEND			
10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining // // // // // Eroded Bank xxx Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree † Seep/Spring - - - - Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert			
PROFILE:		Horz. Scale 5	Vert. Scale 2

DS1

GENERAL INFORMATION									
PROJECT #: 21-1238		PROJECT DESCRIPTION: Cooksville Creek			DAY: 19	MONTH: 10	YEAR: 2021		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown									
COLLECTORS: PC, OB		WEATHER CONDITIONS: clear			TIME STARTED: 9:20		TIME FINISHED: 12:45		
AIR TEMP: 16		WATER TEMP: 11°C			CONDUCTIVITY (µS/cm): n/a				
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Cooksville Creek		DRAINAGE SYSTEM: Lake Ontario			CROSSING #: N/A		STATION #: N/A		
LOCATION OF CROSSING: Camilla Rd, Mississauga, Ontario									
GPS COORDINATES: 43 574370 ^w , 79 558431 ^{ow}					MTO CHAINAGE: N/A				
TOWNSHIP: Peel Region					MNR DISTRICT: Aurora				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: residential					SOURCES OF POLLUTION: stormwater outlets dumping				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input checked="" type="checkbox"/>	
Other <input type="radio"/> Describe:							Size (w x h) m ²		
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: DS1				SECTION LOCATION: (include on habitat map) DS from Camilla Rd bridge 43.573818 ^{ow} , 79.558378 ^{ow}					
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:			
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n/a			
TOTAL SECTION LENGTH (m): 50m				CURRENT VELOCITY (m/s): ✓					
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other			
Percentage of area	5	5	45%	40%	0				
Mean depth wetted (m)	32	38	9	68	—				
Mean width wetted (m)	9m	9m	9m	9m	—				
Mean bankfull width (m)	13m	13m	13m	13m	—				
Mean bankfull depth (m)	1-2m	1-2m	1-2m	1-2m	—				
Substrate	Gr, Sa, Co	Gr, Sa, Co Bo	Gr, Sa, Co Bo	Gr, Sa, Co	—				
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	
	Gr 60	30	10		20				
	SA 20	30	10		60				
	Co 40	30	70		20				
	Bo 0	10	10						

051

BANK STABILITY								
		Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank		0	0	<input checked="" type="checkbox"/>	0			
Right Upstream Bank		0	0	<input checked="" type="checkbox"/>	0			
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
	2	1	90	Instream 1	Overhanging 2	1	Instream 60% algae Overhanging 10	
SHORE COVER (% stream shaded):		100 - 90 %	90 - 60%	60 - 30%		30 - 1%	None	
		0	0	<input checked="" type="checkbox"/>		0	0	
VEGETATION TYPE (%):		Submergent		Floating		Emergent		None
		60		0		2		
Predominant Species		algae				phragmites		
MIGRATORY OBSTRUCTIONS:		<input checked="" type="checkbox"/> None		Seasonal		Permanent		
POTENTIAL CRITICAL HABITAT LIMITING:		<input checked="" type="checkbox"/> Spawning below riffle, rest stop in pool		Evidence of Groundwater		Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
<p>bank stabilization non-native species in riparian area lack of in stream vegetation</p>								
COMMENTS:								
<p>phragmites upstream of lower stormwater inputs FOOT dominated by willow, maple + elm</p>								
Additional Notes Appended? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes number of pages <u>7</u>								



BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	0	0	0	0
Right Upstream Bank	0 <small>VIPK section</small>	0	0	0 <small>lower section</small>

HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
	15%	5	50	Instream 10	Overhanging 20	10	Instream 0 Overhanging 10	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None			
	0	0	0	0	0			
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None	
	0		0		10			
Predominant Species	/		/		LYTSAL PHAARU SCITAB			
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent			
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning bellow riffles		Evidence of Groundwater No		Other			

POTENTIAL ENHANCEMENT OPPORTUNITIES:

degraded/eroded shoreline
 No in water vegetation
 bank stabilization
 Non-native riparian species - Japanese Knotweed
 - European Buckthorn

COMMENTS:

F007 dominated by willow, maple & Elm

SECTION IDENTIFIER: D52	SECTION LOCATION: 43.574132°N 79.597569°W	SECTION LENGTH (m): 50 m	SCALE (cm / m): 1 box = 2m
			PROJECT #: 21-1238
			MAPPER: PC
			NAME OF WATERBODY: Cooksville Creek
			CROSSING #: N/A
			STATION #: D51
			DATE: DD-MMM-YY 19/10/21
LEGEND			
10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate ○○○○ Cobble /Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining // // // // Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ® Riparian Tree ▸ Seep/Spring - - - - Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert			
PROFILE:	Horz. Scale	Vert. Scale	

Appendix 4. Flora and Fauna Species List

Scientific Name	Common Name
Flora	
<i>Acer negundo</i>	Manitoba Maple
<i>Acer platanoides</i>	Norway Maple
<i>Acer saccharinum</i>	Silver Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Acer x freemanii</i>	Hybrid Soft Maple
<i>Aegopodium podagraria</i>	Goutweed
<i>Agrostis gigantea</i>	Red-top
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Ambrosia artemisiifolia</i>	Annual Ragweed
<i>Ambrosia trifida</i>	Great Ragweed
<i>Amphicarpaea bracteata</i>	American Hog-peanut
<i>Anemone canadensis</i>	Canada Anemone
<i>Arctium minus ssp. minus</i>	Common Burdock
<i>Arisaema triphyllum ssp. triphyllum</i>	Jack-in-the-pulpit
<i>Artemisia vulgaris</i>	Common Wormwood
<i>Asclepias syriaca</i>	Common Milkweed
<i>Barbarea vulgaris</i>	Yellow Rocket
<i>Bidens frondosa</i>	Devils Beggar-ticks
<i>Boehmeria cylindrica</i>	False Nettle
<i>Bromus inermis ssp. inermis</i>	Awnless Brome
<i>Calystegia sepium ssp. americanum</i>	Hedge Bindweed
<i>Campanula rapunculoides</i>	Creeping Bellflower
<i>Carex gracillima</i>	Graceful Sedge
<i>Carex projecta</i>	Necklace Sedge
<i>Carex sp.</i>	Sedge sp.
<i>Carex vulpinoidea</i>	Fox Sedge
<i>Catalpa speciosa</i>	Northern Catalpa
<i>Celastrus scandens</i>	Climbing Bittersweet
<i>Chelidonium majus</i>	Celandine
<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy
<i>Cichorium intybus</i>	Chicory
<i>Circaea canadensis subsp. canadensis</i>	Canada Enchanter's Nightshade
<i>Cirsium arvense</i>	Canada Thistle
<i>Cirsium vulgare</i>	Bull Thistle
<i>Clematis virginiana</i>	Virgins-bower

Scientific Name	Common Name
<i>Convolvulus arvensis</i>	Field Bindweed
<i>Cornus racemosa</i>	Gray Dogwood
<i>Cornus stolonifera</i>	Red-osier Dogwood
<i>Coronilla varia</i>	Crown-vetch
<i>Crataegus sp.</i>	Hawthorn sp.
<i>Cryptotaenia canadensis</i>	Canada Honewort
<i>Dactylis glomerata</i>	Orchard Grass
<i>Daucus carota</i>	Wild Carrot
<i>Dianthus armeria</i>	Deptford-pink
<i>Dipsacus fullonum ssp. sylvestris</i>	Wild Teasel
<i>Echinocystis lobata</i>	Wild Mock-cucumber
<i>Elymus repens</i>	Creeping Wild Rye
<i>Erigeron annuus</i>	White-top Fleabane
<i>Erigeron canadensis</i>	Canada Fleabane
<i>Euonymus alata</i>	Winged Burning Bush
<i>Euonymus europaea</i>	European Spindle Tree
<i>Eupatorium perfoliatum</i>	Common Boneset
<i>Euthamia graminifolia</i>	Flat-top Fragrant-golden-rod
<i>Fagus grandifolia</i>	American Beech
<i>Fragaria virginiana ssp. virginiana</i>	Virginia Strawberry
<i>Fraxinus americana</i>	White Ash
<i>Fraxinus pennsylvanica</i>	Red Ash
<i>Galium mollugo</i>	White Bedstraw
<i>Geranium robertianum</i>	Herb-robert
<i>Geum aleppicum</i>	Yellow Avens
<i>Geum canadense</i>	White Avens
<i>Geum laciniatum</i>	Rough Avens
<i>Geum urbanum</i>	Clover-root
<i>Glechoma hederacea</i>	Ground Ivy
<i>Glyceria striata</i>	Fowl Manna-grass
<i>Hackelia virginiana</i>	Virginia Stickseed
<i>Helianthus divaricatus</i>	Woodland Sunflower
<i>Helianthus tuberosus</i>	Jerusalem Artichoke
<i>Heracleum maximum</i>	Cow-parsnip
<i>Hesperis matronalis</i>	Dames Rocket
<i>Hieracium aurantiacum</i>	Orange Hawkweed

Scientific Name	Common Name
<i>Hordeum jubatum ssp. jubatum</i>	Foxtail Barley
<i>Hypericum perforatum</i>	Common St. Johns-wort
<i>Impatiens capensis</i>	Spotted Jewel-weed
<i>Impatiens glandulifera</i>	Purple Jewelweed
<i>Inula helenium</i>	Elecampane Flower
<i>Juglans cinerea</i>	Butternut
<i>Juglans nigra</i>	Black Walnut
<i>Juncus nodosus</i>	Knotted Rush
<i>Juncus tenuis</i>	Path Rush
<i>Juniperus virginiana</i>	Eastern Red Cedar
<i>Lactuca biennis</i>	Tall Blue Lettuce
<i>Lapsana communis</i>	Common Nipplewort
<i>Lathyrus latifolius</i>	Everlasting Pea
<i>Lemna minor</i>	Lesser Duckweed
<i>Leonurus cardiaca ssp. cardiaca</i>	Motherwort
<i>Ligustrum vulgare</i>	European Privet
<i>Linaria vulgaris</i>	Butter-and-eggs
<i>Lonicera tatarica</i>	Tartarian Honeysuckle
<i>Lotus corniculatus</i>	Birds-foot Trefoil
<i>Lysimachia ciliata</i>	Fringed Loosestrife
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Malus pumila</i>	Common Crabapple
<i>Medicago lupulina</i>	Black Medic
<i>Medicago sativa ssp. sativa</i>	Alfalfa
<i>Melilotus alba</i>	White Sweet Clover
<i>Melilotus officinalis</i>	Garden Balm
<i>Morus alba</i>	White Mulberry
<i>Oenothera biennis</i>	Common Evening-primrose
<i>Osmorhiza claytonii</i>	Hairy Sweet-cicely
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel
<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Parthenocissus vitacea</i>	Thicket Creeper
<i>Pastinaca sativa</i>	Wild Parsnip
<i>Persicaria hydropiperoides</i>	Marshpepper Smartweed
<i>Persicaria lapathifolia</i>	Dock-leaf Smartweed
<i>Persicaria maculosa</i>	Ladys Thumb

Scientific Name	Common Name
<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Phleum pratense</i>	Meadow Timothy
<i>Phragmites australis</i>	Common Reed
<i>Physalis heterophylla</i>	Clammy Ground-cherry
<i>Picea abies</i>	Norway Spruce
<i>Pinus nigra</i>	Black Pine
<i>Pinus strobus</i>	Eastern White Pine
<i>Pinus sylvestris</i>	Scotch Pine
<i>Plantago major</i>	Nipple-seed Plantain
<i>Plantago rugelii</i>	Black-seed Plantain
<i>Platanus occidentalis</i>	Sycamore
<i>Poa compressa</i>	Canada Bluegrass
<i>Poa palustris</i>	Fowl Bluegrass
<i>Poa pratensis ssp. pratensis</i>	Kentucky Bluegrass
<i>Podophyllum peltatum</i>	May Apple
<i>Polygonum aviculare</i>	Prostrate Knotweed
<i>Populus balsamifera ssp. balsamifera</i>	Balsam Poplar
<i>Populus deltoides</i>	Cottonwood
<i>Populus grandidentata</i>	Large-tooth Aspen
<i>Populus tremuloides</i>	Trembling Aspen
<i>Potentilla recta</i>	Sulphur Cinquefoil
<i>Prunella vulgaris ssp. lanceolata</i>	Heal-all
<i>Prunus avium</i>	Sweet Cherry
<i>Prunus serotina</i>	Black Cherry
<i>Prunus virginiana ssp. virginiana</i>	Choke Cherry
<i>Quercus alba</i>	White Oak
<i>Quercus macrocarpa</i>	Bur Oak
<i>Quercus rubra</i>	Northern Red Oak
<i>Ranunculus abortivus</i>	Kidney-leaved Buttercup
<i>Ranunculus acris</i>	Tall Butter-cup
<i>Reynoutria japonica var. japonica</i>	Japanese Knotweed
<i>Rhamnus cathartica</i>	European Buckthorn
<i>Rhus typhina</i>	Staghorn Sumac
<i>Ribes americanum</i>	Wild Black Currant
<i>Robinia pseudo-acacia</i>	Black Locust
<i>Rosa canina</i>	Dog Rose

Scientific Name	Common Name
<i>Rosa multiflora</i>	Multiflora Rose
<i>Rosa sp.</i>	Rose sp.
<i>Rubus idaeus ssp. Melanolasius</i>	Red Raspberry
<i>Rubus occidentalis</i>	Black Raspberry
<i>Rudbeckia hirta</i>	Black-eyed Susan
<i>Rumex crispus</i>	Curly Dock
<i>Salix alba</i>	White Willow
<i>Salix eriocephala</i>	Heart-leaved Willow
<i>Salix fragilis</i>	Crack Willow
<i>Salix interior</i>	Sandbar Willow
<i>Salix sp.</i>	Willow sp.
<i>Salix x rubens</i>	Hybrid Willow
<i>Setaria pumila</i>	Yellow Foxtail
<i>Solanum dulcamara</i>	Bittersweet Nightshade
<i>Solidago altissima var. altissima</i>	Tall Goldenrod
<i>Solidago caesia</i>	Bluestem Goldenrod
<i>Solidago canadensis</i>	Canada Goldenrod
<i>Solidago flexicaulis</i>	Broad-leaved Goldenrod
<i>Solidago gigantea</i>	Smooth Goldenrod
<i>Solidago nemoralis ssp. nemoralis</i>	Gray Goldenrod
<i>Sonchus arvensis ssp. arvensis</i>	Field Sow-thistle
<i>Sorbaria sorbifolia</i>	False Spiraea
<i>Sorbus americana</i>	Mountain Ash
<i>Sorbus decora</i>	Northern Mountain-ash
<i>Stellaria media</i>	Common Starwort
<i>Symphyotrichum lanceolatum</i>	White Panicked Aster
<i>Symphyotrichum lateriflorum</i>	Calico Aster
<i>Symphyotrichum novae-angliae</i>	New England Aster
<i>Syringa reticulata</i>	Japanese Tree Lilac
<i>Syringa vulgaris</i>	Lilac
<i>Taraxacum officinale</i>	Common Dandelion
<i>Thlaspi arvense</i>	Field Penny-cress
<i>Tilia americana</i>	American Basswood
<i>Tilia cordata</i>	Little-leaf Linden
<i>Torilis japonica</i>	Erect Hedge-parsley
<i>Tragopogon dubius</i>	Meadow Goats-beard

Scientific Name	Common Name
<i>Trifolium hybridum ssp. elegans</i>	Alsike Clover
<i>Trifolium pratense</i>	Red Clover
<i>Trifolium repens</i>	White Clover
<i>Tussilago farfara</i>	Colts Foot
<i>Typha angustifolia</i>	Narrow-leaved Cattail
<i>Typha latifolia</i>	Broad-leaf Cattail
<i>Typha x glauca</i>	Blue Cattail
<i>Ulmus americana</i>	American Elm
<i>Ulmus pumila</i>	Siberian Elm
<i>Urtica dioica ssp. gracilis</i>	American Stinging Nettle
<i>Verbascum thapsus</i>	Great Mullein
<i>Verbena hastata</i>	Blue Vervain
<i>Verbena urticifolia</i>	White Vervain
<i>Veronica officinalis</i>	Gypsy-weed
<i>Viburnum lantana</i>	Wayfaring Tree
<i>Vicia cracca</i>	Tufted Vetch
<i>Viola sororia</i>	Woolly Blue Violet
<i>Vitis riparia</i>	Riverbank Grape
Fauna	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Anas platyrhynchos</i>	Mallard
<i>Bombycilla cedrorum</i>	Cedar Waxwing
<i>Canis latrans</i>	Coyote
<i>Cardinalis cardinalis</i>	Northern Cardinal
<i>Chaetura pelagica</i>	Chimney Swift
<i>Colaptes auratus</i>	Northern Flicker
<i>Columba livia</i>	Rock Pigeon
<i>Contopus virens</i>	Eastern Wood-pewee
<i>Corvus brachyrhynchos</i>	American Crow
<i>Cyanocitta cristata</i>	Blue Jay
<i>Dumetella carolinensis</i>	Gray Catbird
<i>Haemorhous mexicanus</i>	House Finch
<i>Hirundo rustica</i>	Barn Swallow
<i>Larus delawarensis</i>	Ring-billed Gull
<i>Leuconotopicus villosus</i>	Hairy Woodpecker
<i>Melospiza melodia</i>	Song Sparrow

Scientific Name	Common Name
<i>Mephitis mephitis</i>	Striped Skunk
<i>Molothrus ater</i>	Brown-headed Cowbird
<i>Myiarchus crinitus</i>	Great Crested Flycatcher
<i>Passer domesticus</i>	House Sparrow
<i>Passerina cyanea</i>	Indigo Bunting
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak
<i>Picoides pubescens</i>	Downy Woodpecker
<i>Poecile atricapillus</i>	Black-capped Chickadee
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher
<i>Quiscalus quiscula</i>	Common Grackle
<i>Sayornis phoebe</i>	Eastern Phoebe
<i>Sciurus carolinensis</i>	Eastern Grey Squirrel
<i>Setophaga petechia</i>	Yellow Warbler
<i>Sitta carolinensis</i>	White-breasted Nuthatch
<i>Spinus tristis</i>	American Goldfinch
<i>Spizella passerina</i>	Chipping Sparrow
<i>Spizella pusilla</i>	Field Sparrow
<i>Sturnus vulgaris</i>	European Starling
<i>Sylvilagus floridanus</i>	Eastern Cottontail
<i>Toxostoma rufum</i>	Brown Thrasher
<i>Turdus migratorius</i>	American Robin
<i>Vireo gilvus</i>	Warbling Vireo
<i>Vireo olivaceus</i>	Red-eyed Vireo
<i>Zenaida macroura</i>	Mourning Dove

Appendix 5. Species at Risk Screening Table

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Plants							
American Chestnut <i>Castanea dentata</i>	MECP 2021	SARO- END COSEWIC- END SARA- END	Moist to well drained forests on sand, occasionally heavy soils (OMNR 2000).	No habitat present on site.	NAS surveys in Camilla Natural Area, Botanical inventory and notable tree survey in Study Area.	None. No suitable habitat and species not recorded during surveys.	None.
Butternut <i>Juglans cinerea</i>	MECP 2021, NAS 2021	SARO- END COSEWIC- END SARA- END	Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges (Government of Ontario 2021).	Potential habitat present (i.e., deciduous forest along a stream)	NAS surveys in Camilla Natural Area, Botanical inventory, and notable tree survey in Study Area.	MODERATE. Suitable habitat is present, and Butternut has been recorded in Camilla Natural Area. However, this species was not observed within the Study Area during October 2021 surveys. A detailed tree inventory will be conducted in 2022.	None. A detailed tree inventory will be conducted in 2022. If any Butternut are located within the Study Area, and if they have potential to be harmed, killed, or taken during construction activities, the tree(s) are recommended to be assessed by a provincially designated Butternut Health Assessor and a report submitted to MECP. Butternut is protected under the ESA. The ESA and O. Reg. 242/08 shall be referenced for direction on next steps should Butternut be located within the Study Area.
Insects							
Monarch <i>Danaus plexippus</i>	Butterfly Atlas (2019)	SARO- SC COSEWIC- END SARA- SC	Breeding habitat is confined to where milkweed grows, since the leaves of these plants are the sole food of the caterpillars. Different species of milkweed grow in a variety of environments, including meadows, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairies, riverbanks, irrigation ditches, arid valleys and south facing hillsides. Nectaring habitat ranges from native grasslands to home gardens with	Potential habitat present (i.e., open habitat along Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	LOW. Common Milkweed (caterpillar host plant) has been recorded within Camilla Natural Area; however, milkweed is not present within the Study Area.	None. Host plant is not present. Although there is potential for nectaring habitat used by foraging individuals to be removed during construction, this habitat is common in the regional landscape.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
			adult butterflies nectaring on a wide variety of flowers including Goldenrods, Asters and Milkweeds. (Environment Canada 2014)			Nectaring habitat (flowering plants) is present.	
Mottled Duskywing <i>Erynnis martialis</i>	Butterfly Atlas (1950)	SARO- END COSEWIC- END SARA- N/A	Tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. (Alvars are areas of limestone with shallow soil and sparse vegetation of grasses, shrubs, and wildflowers (Ontario 2021)	No habitat present on site.	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	None. No suitable habitat and species not recorded during surveys.	None.
Amphibians							
Jefferson Salamander <i>Ambystoma hybrid pop. 1</i>	ORRA (2005)	SARO- END COSEWIC- END SARA- N/A	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs (OMNR 2000).	No habitat present on site.	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	None. No suitable habitat and species not recorded during surveys.	None.
Western Chorus Frog <i>Pseudacris triseriata pop. 2</i>	ORRA (1989)	SARO- NAR COSEWIC- THR SARA- THR	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools (OMNR 2000).	No habitat present on site.	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	None. No suitable habitat and species not recorded during surveys.	None.
Reptiles							
Blanding's Turtle <i>Emydoidea blandingii</i>	ORAA (2018)	SARO- THR COSEWIC- THR SARA- N/A	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft, muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed (OMNR 2000)	Potential habitat present (i.e., Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	LOW. Potential habitat is present, however species is rarely encountered within Mississauga, and it has not been recorded during surveys.	None, with mitigation. Recommended mitigation includes exclusionary fencing around terrestrial works. If SAR turtles or nests are encountered, work should cease immediately, and the construction administrator or environmental inspector be contacted for direction.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Eastern Milksnake <i>Lampropeltis triangulum</i>	NHIC, ORRA (2017)	SARO- NAR COSEWIC- SC SARA- SC	Farmlands, meadows, hardwood, or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites (OMNR 2000).	Potential habitat present (i.e., woodland, riparian area)	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	LOW Potential habitat is present, however species was not recorded during surveys.	None, with mitigation. Recommended mitigation includes exclusionary fencing around terrestrial works.
Eastern Musk Turtle <i>Sternotherus odoratus</i>	ORAA (1969)	SARO- SC COSEWIC- SC SARA- SC	Aquatic, except when laying eggs; shallow slow moving water of lakes, streams, marshes and ponds; hibernate in underwater mud, in banks or in muskrat lodges; eggs are laid in debris or under stumps or fallen logs at waters edge; often share nest sites; sometimes congregate at hibernation sites; not readily observed (OMNR 2000).	Potential habitat present (i.e. Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and the Study Area survey	None. No suitable habitat and species not recorded during surveys. Species is only known historically (1969.)	None.
Midland Painted Turtle <i>Chrysemys picta marginata</i>	NHIC, ORRA (2019)	SARO- N/A COSEWIC- SC SARA- N/A	Quiet, warm, shallow water with abundant aquatic vegetation such as ponds, large pools, streams, ditches, swamps, marshy meadows; eggs are laid in sandy places, usually in a bank or hillside, or in fields; basks in groups; not territorial (OMNR 2000).	Potential habitat present (i.e., Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	MODERATE Suitable habitat is present though marginal due to channel design. Additionally, there are barriers to aquatic and terrestrial movement along Cooksville Creek. Not recorded during surveys.	None, with mitigation. Recommended mitigation includes exclusionary fencing around terrestrial works. If SAR turtles or nests are encountered, work should cease immediately, and the construction administrator or environmental inspector be contacted for direction.
Northern Map Turtle <i>Graptemys geographica</i>	NHIC, ORRA (2014)	SARO- SC COSEWIC- SC SARA- SC	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas; aquatic corridors (e.g. stream) are required for movement; not readily observed (OMNR 2000).	Potential habitat present (i.e., Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	LOW Marginal habitat present (e.g., Cooksville Creek is not a large watercourse with a soft bottom)	None, with mitigation. Recommended mitigation includes exclusionary fencing around terrestrial works. If SAR turtles or nests are encountered, work should cease immediately, and the construction administrator or environmental inspector be contacted for direction.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Snapping Turtle <i>Chelydra serpentina</i>	NHIC, ORRA (2019)	SARO- SC COSEWIC- SC SARA- SC	Permanent, semi-permanent fresh water; marshes, swamps, or bogs; rivers and streams with soft, muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha (OMNR 2000).	Potential habitat present (i.e., Cooksville Creek)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	MODERATE Suitable habitat is present though marginal due to channel design. Additionally, there are barriers to aquatic and terrestrial movement along Cooksville Creek. Not recorded during surveys.	None, with mitigation. Recommended mitigation includes exclusionary fencing around terrestrial works. If SAR turtles or nests are encountered, work should cease immediately, and the construction administrator or environmental inspector be contacted for direction.
Birds							
Bank Swallow <i>Riparia riparia</i>	OBBA	SARO - THR COSEWIC - THR SARA - THR	Sand, clay, or gravel riverbanks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence (OMNR 2000).	Potential habitat present if any portions of the Cooksville Creek within the Study Area have natural banks.	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	None. No suitable habitat present (i.e., no natural creek banks)	None
Barn Swallow <i>Hirundo rustica</i>	OBBA, eBird 2021, NAS	SARO - THR COSEWIC - THR SARA - THR	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water (OMNR 2000).	Potential foraging habitat present. Potential nesting habitat present (i.e., Camilla Road bridge)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	HIGH Suitable habitat is present for foraging. Potential nesting habitat is present (i.e., Camilla Road bridge). Species has been observed in Camilla Natural Area, though it is unknown whether Barn Swallow uses the Study Area.	None, with mitigation. Recommended mitigation includes restricting construction activities on or near structures to outside of the breeding bird window. Should this not be possible, a qualified avian biologist should conduct due diligence nesting surveys within 48 hours of the proposed works. Protective buffers around nests may be required, and / or a temporary cessation of construction until the nestlings fledge. In addition, exclusionary netting to prevent nesting could be considered.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Bobolink <i>Dolichonyx oryzivorus</i>	OBBA	SARO- THR COSEWIC- THR SARA- THR	Large, open expansive grasslands with dense ground cover; hayfields, meadows, or fallow fields; marshes; requires tracts of grassland >50 ha (OMNR 2000).	No habitat is present on site.	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	None. No suitable habitat and species not recorded during surveys.	None.
Chimney Swift <i>Chaetura pelagica</i>	OBBA, eBird 2020, NAS	SARO - THR COSEWIC - THR SARA - THR	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water (OMNR 2000).	Potential foraging habitat present. Potential, though unlikely, to nest in hollow trees within the Study Area (urban individuals primarily use chimneys).	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	LOW Marginal habitat present in hollow trees, species not recorded during surveys.	None, with mitigation. Any tree removals are recommended to occur outside of the nesting bird season. Should this not be possible, a qualified avian biologist should conduct due diligence nesting surveys within 48 hours of the proposed works. Protective buffers around nests may be required, and / or a temporary cessation of construction until the nestlings fledge.
Eastern Meadowlark <i>Sturnella magna</i>	OBBA, eBird 1990	SARO - THR COSEWIC - THR SARA - THR	Open, grassy meadows, farmland, pastures, hayfields, or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size (OMNR 2000).	No habitat is present on site.	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	None. No suitable habitat and species not recorded during surveys.	None.
Eastern Wood-pewee <i>Contopus virens</i>	OBBA, ebird 2018, NSE 2017	SARO - SC COSEWIC - SC SARA - SC	Open, deciduous, mixed, or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks (OMNR 2000).	Potential habitat present (i.e., forest).	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	HIGH Recorded during NAS surveys and identified during background review (eBird) within Camilla Natural Area, though unknown whether it uses the Study Area.	None, with mitigation. Any tree removals are recommended to occur outside of the nesting bird season. Should this not be possible, a qualified avian biologist should conduct due diligence nesting surveys within 48 hours of the proposed works Protective buffers around nests may be required, and / or a temporary cessation of construction until the nestlings fledge.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Henslow's Sparrow <i>Centronyx henslowii</i>	NHIC	SARO- END COSEWIC- END SARA- END	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha (OMNR 2000).	No habitat is present on site.	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	None. No suitable habitat and species not recorded during surveys.	None.
Wood Thrush <i>Hylocichla mustelina</i>	OBBA	SARO - SC COSEWIC - THR SARA - THR	Carolinian and Great Lakes-St. Lawrence Forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m (OMNR 2000).	Potential habitat present (i.e., forest), though marginal. Wood Thrush prefer large blocks of mature forest.	Incidental wildlife inventoried during all NAS surveys and Study Area surveys	LOW Marginal habitat present in the forest, species not recorded during surveys.	None, with mitigation. Any tree removals are recommended to occur outside of the nesting bird season.
Mammals							
Eastern Small-footed Myotis <i>Myotis leibii</i>	N/A	SARO- END COSEWIC- N/A SARA- N/A	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests (OMNR 2000).	Potential habitat present (i.e., trees)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys. However, nighttime visual and acoustic surveys were not conducted.	MODERATE Potential habitat is present in the forest. Species not recorded during surveys. However, species is known to be present in Mississauga. Targeted bat surveys not conducted.	None, with mitigation. Any tree removals are recommended to occur outside of the active bat season.
Little Brown Myotis <i>Myotis lucifugus</i>	MECP 2021	SARO- END COSEWIC- END SARA- END	Uses caves, quarries, tunnels, hollow trees, or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges (OMNR 2000).	Potential habitat present (i.e., trees)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys. However, nighttime visual and acoustic surveys were not conducted.	MODERATE Potential habitat is present in the forest. Species not recorded during surveys. However, species is known to be present in Mississauga. Targeted bat surveys not conducted.	None, with mitigation. Any tree removals are recommended to occur outside of the active bat season.

Species at Risk							
Species	Source	Status	Habitat Description	Habitat Present on Site	Surveys Conducted	Probability of Occurrence and Rationale	Potential to be Impacted by Proposed Activities
Northern Long-eared Myotis <i>Myotis septentrionalis</i>	MECP 2021	SARO- END COSEWIC- END SARA- END	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy (OMNR 2000).	Potential habitat present (i.e., trees)	Incidental wildlife inventoried during all NAS surveys and Study Area surveys. However, nighttime visual and acoustic surveys were not conducted.	MODERATE Potential habitat is present in the forest. Species not recorded during surveys; however, species is known to be present in Mississauga. Targeted bat surveys not conducted.	None, with mitigation. Any tree removals are recommended to occur outside of the active bat season.
Fish							
NONE							

APPENDIX B

Stage 1 & 2 Archeological Assessment

Stage 1 Archaeological Assessment Cooksville Creek Erosion Control at Camilla Road (Lot 14-15, Concession 1 South of Dundas Street, Former Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel

Original Report

Prepared for:

Resilient Consulting

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PIF P1066-0257-2021

Archaeological Services Inc. File: 21EA-134

November 26, 2021



Executive Summary

Archaeological Services Inc. (ASI) was contracted by Resilient Consulting to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Cooksville Creek Erosion Project at Camilla Road. This project involves developing a restoration design for Cooksville Creek which mitigates existing erosion problems and provides long-term stability to the channel corridor. Cooksville Creek has been identified as a high priority site in need of rehabilitation. Three main areas of concern are failed gabion basket walls that are slumping and undermined, fractured bed and banks of the concrete-lined channel and an accumulation of sediment, debris, and in-channel vegetation growth.

The Stage 1 background study determined that there are no previously registered archaeological sites located within 50 metres and, that there are three sites within one kilometre of the Study Area. The property inspection determined that part of the Study Area exhibits archaeological potential and will require Stage 2 survey, while the remainder of the Study Area has been subject to previous disturbance from realignment, channelization, and buried infrastructure.

The following recommendations are made:

- 1 Part of the Study Area exhibits archaeological potential and will require Stage 2 test pit survey prior to any proposed construction activities on these lands (Figure 13: areas highlighted in green);
- 2 The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and slopes in excess of 20 degrees. These lands do not require further archaeological assessment; and,
- 3 Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.



Project Personnel

- **Senior Project Manager:** Lisa Merritt, MSc. (P094) Partner, Director, Environmental Assessment Division
- **Project Coordinator:** Katrina Thach, Hon. BA (R1225), Associate Archaeologist, Project Coordinator, Environmental Assessment Division
- **Project Administrator:** Rachel Wedekind, Hon. BA, Archaeologist, Project Administrator, Environmental Assessment Division
- **Project Director:** Jessica Lytle, MSc (P1066), Lead Archaeologist, Project Manager, Environmental Assessment Division
- **Project Manager:** Eliza Brandy, MA (R1109), Associate Archaeologist, Project Manager, Environmental Assessment Division
- **Field Director:** Alexis Dunlop, MSc. (P1146), Lead Bioarchaeologist, Manager – Laboratory and Fieldwork Services, Operations Division
- **Report Preparation:** Laura Burke, Hons BA (R1113), Associate Archaeologist, Technical Writer and Researcher, Environmental Assessment Division
- **Graphics:** Peter Bikoulis, PhD, Archaeologist, GIS Technician, Operation Division
- **Report Reviewer:** Eliza Brandy



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1.0 Project Context

ASI was contracted by Resilient Consulting to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Cooksville Creek Erosion Project at Camilla Road (Figure 1). This project involves developing a restoration design for Cooksville Creek which mitigates existing erosion problems and provides long-term stability to the channel corridor. Cooksville Creek has been identified as a high priority site in need of rehabilitation. Three main areas of concern are failed gabion basket walls that are slumping and undermined, fractured bed and banks of the concrete-lined channel and an accumulation of sediment, debris, and in-channel vegetation growth.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (Ontario Heritage Act, R.S.O. c. O.18, 1990, as amended in 2019) and the 2011 *Standards and Guidelines for Consultant Archaeologists (S & G)*, administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (M.H.S.T.C.I., 2011).

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act, RSO* (Environmental Assessment Act, R.S.O., 1990 as amended 2020) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (Municipal Class Environmental Assessment, 2000, as amended 2015).

Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment and property inspection was granted by Resilient Consulting on September 15, 2021.



1.1.1 Treaties and Traditional Territories

The Study Area is within Treaty 13a, signed on August 2, 1805, by the Mississaugas and the British Crown in Port Credit at the Government Inn. A provisional agreement was reached with the Crown on August 2, 1805, in which the Mississaugas ceded 70,784 acres of land bounded by the Toronto Purchase of 1787 in the east, the Brant Tract in the west, and a northern boundary that ran six miles back from the shoreline of Lake Ontario. The Mississaugas also reserved the sole right of fishing at the Credit River and were to retain a one-mile strip of land on each of its banks, which became the Credit Indian Reserve. On September 5, 1806, the signing of Treaty 14 confirmed the Head of the Lake Purchase between the Mississaugas of the Credit and the Crown (Mississauga of the New Credit First Nation, 2001; Mississaugas of the Credit First Nation, 2017).

1.2 Historical Context

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris, 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards & Fritz, 1988) and populations now occupied less extensive territories (Ellis & Deller, 1990). The Lake Iroquois strandline ca. 12,500 BP is documented to have several small 10-11,000-year-old archaeological sites in the Duffins Creek watershed.

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for



cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Brown, 1995, p. 13; Ellis et al., 1990, 2009).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. The Woodland period begins around 2,500 BP and exchange and interaction networks broaden at this time (Spence et al., 1990, pp. 136, 138) and by approximately 2,000 BP, evidence exists for small community camps, focusing on the seasonal harvesting of resources (Spence et al., 1990, pp. 155, 164). By 1,500 BP there is macro botanical evidence for maize in southern Ontario, and it is thought that maize only supplemented people's diet. There is earlier phytolithic evidence for maize in central New York State by 2,300 BP - it is likely that once similar analyses are conducted on Ontario ceramic vessels of the same period, the same evidence will be found (Birch & Williamson, 2013, pp. 13–15). As is clearly evident in the detailed ethnographies of Anishinaabek populations, winter was a period during which some families would depart from the larger group as it was easier to sustain smaller populations (Rogers 1962). It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From the beginning of the Late Woodland period at approximately 1,000 BP, lifeways became more similar to that described in early historical documents. Between approximately 1000-1300 Common Era (CE), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson, 1990, p. 317). By 1300-1450 CE, this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al., 1990, p. 343). From 1450-1649 CE this process continued with the coalescence of these small villages into larger communities (Birch & Williamson, 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed.



By 1600 CE, the Huron- Wendat communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries. In the 1640s, the traditional enmity between the Haudenosaunee and the Huron-Wendat (and their Algonquian allies such as the Nipissing and Odawa) led to the dispersal of the Huron-Wendat. Shortly afterwards, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. By the 1690s however, the Anishinaabeg were the only communities with a permanent presence in southern Ontario. From the beginning of the eighteenth century to the assertion of British sovereignty in 1763, there was no interruption to Anishinaabeg control and use of southern Ontario.

1.2.2 Post-Contact Settlement

Historically, the Study Area is located in the Former Toronto Township, County of Peel in Lots 14 and 15 in Concession 1 South of Dundas Street.

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the Ontario Heritage Act or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 metres of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading



posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI 2006).

Toronto Township

At the conclusion of the American War of Independence (1774-1783), the British were forced to recognize the emergence of a new political frontier, one that had to be maintained by a strong military presence. In addition, a number of British loyalists travelled north and crossed the border in order to remain in British territory. Many of them were given land grants by the Crown in exchange for loyal service. These new developments ultimately led to the purchase of Mississauga land by the Crown in 1787 (although boundary disputes were not resolved until the signing of a treaty in 1805). The subject property is located within these “New Survey” lands which were surveyed in 1806.

In 1788, the County of Peel was part of the extensive district known as the “Nassau District.” After the province of Quebec was divided into Upper and Lower Canada in 1792, the Nassau District became known as the Home District. The same year, Upper Canada was subdivided into nineteen counties by its first Lieutenant Governor, Colonel John Graves Simcoe, and by 1852, the Home District was replaced by the Counties of York, Ontario, and Peel. Shortly after, the County of Ontario became a separate county, and the question of separation became popular in Peel. A vote for independence was taken in 1866, and in 1867, the village of Brampton was chosen as the capital of the new county.

The first transportation routes to be established followed early Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers. Local roads were initially cleared by the grantees of adjacent land as part of their settlement duties although the many rivers and creeks posed a challenge to the gridded road system, and nineteenth-century maps detail the many jags and detours necessary to avoid bad crossing points.



After Simcoe established York as the capital of Upper Canada, he commissioned the Queen's Rangers to build the Dundas Highway (also known as the Governor's Road) running west to Ancaster and east toward Kingston, hooking up with Kingston Road. This important transportation corridor was intended to provide an overland military route between Lake Ontario, Lake St. Clair, and Lake Huron. The road (later known as Dundas Street now Highway 5) was intended to serve a dual purpose – to support settlement in Upper Canada, and as a deterrent to expansionist American interests. Work on the Governor's Road began in 1793, but the rocky and heavily treed landscape made progress slow, and the route was still barely passable when Simcoe returned to England in 1796. Eventually, Dundas Street served the purpose of supporting settlement in southern Ontario once the colonial government had purchased new lands adjacent to it.

Along the lakeshore, the pre-existing trail was widened and improved as a public road by 1798, but there was no bridge across the Humber River at that time (a ferry operated between 1802 and 1815). Lakeshore Road opened through Etobicoke in 1804, was planked in 1820, and by 1826, a regular stagecoach service ran between York and Niagara. The Toronto Road Company purchased the Lakeshore Road in 1850, turning it into a toll road.

The Hamilton and Toronto Railway was formed in 1852, and in 1855, completed its lake shore route across the south end of Lot 11. In 1871, the railway was amalgamated with the Great Western Railway, which in turn, was amalgamated in 1882, with the Grand Trunk Railway. The Grand Trunk Railway was amalgamated in 1923, with Canadian National Railway (Andreae, 1997).

Town of Cooksville

The historic settlement of Cooksville is located at the intersection of Hurontario Street and Dundas Street East in the City of Mississauga. The first settler of Cooksville was Daniel Harris who arrived from the United States of America in 1800. The settlement was originally named Harrisville. The name was changed in 1836 to Cooksville after local entrepreneur Jacob Cook. Cooksville was a mail hub in the region and an important way-point on the journey between York and Niagara. Cooksville continued to prosper until 1852 when it was mostly razed by fire. The community rebounded in the late-nineteenth century with the expansion



of winemaking, oil refining, and brick making industries, and by 1877 Cooksville had completely recovered. In 1873 Cooksville was chosen as the seat for Toronto Township (Heritage Mississauga, 2009).

1.2.3 Map Review

The *1859 County Atlas of Peel* (Tremaine, 1859) and the *1877 Illustrated Historical Atlas of the County of Peel* (Walker and Miles, 1877) were examined to determine the presence of historic features within the Study Area during the nineteenth century (Figures 2-3). The Study Area is located on Concession 1 South of Dundas Street on part of Lot 14 and 15. Nineteenth-century mapping depicts the Cooksville Creek Study Area southeast of Cooksville village and northwest of the Great Western Railway. The *1859 County Atlas* lists Albert Park as the owner of Lots 14 and 15, while the *1877 Illustrated Atlas* identifies a change of ownership to William Moody. Both atlases show only Cooksville creek and farmland within the Study Area.

Topographic maps from 1909, 1938 and 1961 were examined for historic features in the twentieth century (Department of Militia and Defence, 1909), (Department of Militia and Defence, 1938), (Army Survey Establishment, R.C.E., 1961). In each of these topographic maps (Figures 4-6) power transmission lines are shown adjacent to the eastern border of the Study Area. On the 1938 topographic map a power station is noted northwest of the Study Area as well as another west-east power transmission corridor. On both Figure 4 and 5 the Cooksville Creek Study Area is surrounded by woodlots and is absent of any building structures. The 1961 topographic map illustrates suburban development in the area. Camilla Road cuts through the center of the Study Area, Queen Elizabeth Highway is now to the south and the power transmission corridor remains east of the Study Area.

1.2.4 Aerial and Orthoimagery Review

Historical aerial imagery from the City of Mississauga's Interactive Online Mapping Service (City of Mississauga, 2021) indicates that between 1954 and 1985 Cooksville Creek was significantly disturbed (Figures 6-9). The aerials show that Cooksville Creek was redirected and channelized and that farmland adjacent to the Study Area became a suburban neighbourhood.



The historical aerial imagery indicates:

- that by 1954 Camilla Road had already been constructed through the centre of the Study Area (Figure 6)
- by 1966 a new suburban neighbourhood had been developed adjacent to Cooksville Creek, north of the Study Area (Figure 7)
- by 1977 and 1985 Cooksville Creek had been redirected and channelized (Figures 8 and 9)

A review of available Google satellite imagery shows that within the Study Area there are few visible changes between 2004 and 2019. Cooksville Creek remained within greenspace surrounded by suburban houses, roads, infrastructure corridors and highways. Between 1985 and 2004 a new suburban neighbourhood consisting of dense row houses was constructed south of the Study Area.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the M.H.S.T.C.I. through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

Camilla Road runs through the middle of the Study Area in a northwest to southeast direction. It is a two-lane road with residential housing on either side. Most of the housing units consists of single residences except directly south of the Study Area where there are two large apartment buildings. There is also a series of dense row houses south of the western portion of the Study Area. To the east of the Study Area there is a long, narrow hydro corridor. Northwest of the Study Area, Cooksville Creek connects with Camilla Park which has wide open green spaces and a small area with a play structure. Cooksville Creek itself is a narrow



stream, lined with trees. The recreational trail associated with it is primarily used for running and walking. Figure 12 and Appendix A show the existing conditions of the Study Area.

1.3.2 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow & Warner, 1990, p. Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal



plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The Study Area is located within the Iroquois Plain physiographic region of Southern Ontario, a lowland region bordering Lake Ontario. This region is characteristically flat and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, a body of water that existed during the late Pleistocene. This region extends from the Trent River, around the western part of Lake Ontario, to the Niagara River, spanning a distance of 300 kilometres (Chapman & Putnam, 1984). The old shorelines of Lake Iroquois include cliffs, bars, beaches, and boulder pavements. The old sandbars in this region are good aquifers that supply water to farms and villages. The gravel bars are quarried for road and building material, while the clays of the old lake bed have been used for the manufacture of bricks (Chapman & Putnam, 1984).

The Cooksville Creek watershed drains an area of approximately 33.9 square kilometres. Cooksville Creek originates in the City of Mississauga near Hurontario Street and Britannia Road and flows south to meet its confluence with Lake Ontario in the Lake Iroquois Plain physiographic region west of Cawthra Road (Aquafor Beech Ltd., 2012).

The Study Area is made up of two different well drained soils (Figure 11). The majority is composed of bottom land, an alluvial soil with clay, silt, gravel and may contain organic remains. The most southern tip of the Study Area is fox, a well sorted, stone free, sandy loam (Figure 10).

1.3.3 Previously Registered Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (O.A.S.D.) maintained by the M.H.S.T.C.I. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 kilometres east to west, and approximately 18.5 kilometres north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered



sequentially as they are found. The Study Area under review is located in Borden block AjGv.

According to the O.A.S.D., three previously registered archaeological sites are located within one kilometre of the Study Area, none of which are located within 50 metres (M.H.S.T.C.I., 2021). A summary of the sites is provided below in Table 1.

Table 1: Registered Sites within One Kilometre of the Study Area

Borden number	Site Name	Temporal/ Cultural Affiliation	Site type	Researcher
AjGv-6	Geveny	Archaic	Campsite	Unknown, 1971
AjGv-2	Murphy	Unknown	Unknown	Unknown, 1971
AjGv-12	Pinewood Trail	Unknown	Unknown	Unknown, 1971

1.3.4 Previous Archaeological Assessments

According to the background research, there are no previous reports detailing fieldwork within 50 metres of the Study Area.

2.0 Field Methods

A Stage 1 property inspection must adhere to the S & G, Section 1.2, Standards 1-6, which are discussed below. The entire property and its periphery must be inspected. The inspection may be either systematic or random. Coverage must be sufficient to identify the presence or absence of any features of archaeological potential. The inspection must be conducted when weather conditions permit good visibility of land features. Natural landforms and watercourses are to be confirmed if previously identified. Additional features such as elevated



topography, relic water channels, glacial shorelines, well-drained soils within heavy soils and slightly elevated areas within low and wet areas should be identified and documented, if present. Features affecting assessment strategies should be identified and documented such as woodlots, bogs or other permanently wet areas, areas of steeper grade than indicated on topographic mapping, areas of overgrown vegetation, areas of heavy soil, and recent land disturbance such as grading, fill deposits and vegetation clearing. The inspection should also identify and document structures and built features that will affect assessment strategies, such as heritage structures or landscapes, cairns, monuments or plaques, and cemeteries.

The Stage 1 archaeological assessment property inspection was conducted under the field direction of Alexis Dunlop (P1146) of ASI, on October 28, 2021, in order to gain first-hand knowledge of the geography, topography, and current conditions and to evaluate and map archaeological potential of the Study Area. It was a systematic visual inspection from public lands and right-of-ways only and did not include excavation or collection of archaeological resources. Fieldwork was conducted when weather conditions were deemed clear with good visibility (partly cloudy with seasonal temperatures), per S & G Section 1.2., Standard 2. Field observations are compiled onto the existing conditions of the Study Area in Section 8.0 (Figures 12 and 13) and associated photographic plates are presented in Section 7.0 (Images 1-11).

3.0 Analysis and Conclusions

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the Study Area. Results of the analysis of the Study Area property inspection and background research are presented in Section 3.1.

3.1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites (Table 1);



- Water sources: primary, secondary, or past water source (Cooksville Creek);
- Early historic transportation routes (Middle Road, now Queen Elizabeth Way);
- Proximity to early settlements (Cooksville); and
- Well-drained soils

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The Municipal Heritage Register was consulted and there are no properties within the Study Area is Listed or Designated under the Ontario Heritage Act.

Part of the Study Area within the backyards of 2061, 2065, 2069, and 2081 Camilla Road exhibit archaeological potential up to the top of the creek bank as there is insufficient evidence that these lands were significantly impacted by the historical realignment and channelization of Cooksville Creek in this area (Figure 13: areas highlighted in green). These areas will require Stage 2 test pit survey, prior to any construction impacts. According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide.

The remainder of the Study Area has been subjected to deep soil disturbance events due to the historical realignment of Cooksville Creek and construction of the engineered channel constructed approximately 30 to 40 years ago (Figures 7-9), and, due to the creation of Camilla Road between 1938 and 1954. Appendix A provides a base plan of existing creek features and also shows where modern sewers have been constructed within and adjacent to the Study Area resulting in disturbance. According to the S & G Section 1.3.2 these areas do not retain archaeological potential (Images 1-11; Figure 13: areas highlighted in yellow) and do not require further survey.



3.2 Conclusions

The Stage 1 background study determined that there are no previously registered archaeological sites located within 50 metres and, that there are three sites within one kilometre of the Study Area. The property inspection determined that part of the Study Area exhibits archaeological potential and will require Stage 2 survey, while the remainder of the Study Area has been subject to previous disturbance from realignment, channelization, and buried infrastructure.

4.0 Recommendations

In light of these results, the following recommendations are made:

- 1 Part of the Study Area exhibits archaeological potential and will require Stage 2 test pit survey prior to any proposed construction activities on these lands (Figure 13: areas highlighted in green);
- 2 The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and slopes in excess of 20 degrees. These lands do not require further archaeological assessment; and,
- 3 Should the proposed work extend beyond the current Study Area, further archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Heritage, Sport, Tourism and Culture Industries should be immediately notified.

The above recommendations are subject to Ministry approval, and it is an offence to alter any archaeological site without Ministry of Heritage, Sport, Tourism and Culture Industries concurrence. No grading or other activities that may result in



the destruction or disturbance of any archaeological sites are permitted until notice of M.H.S.T.C.I. approval has been received.



5.0 Legislation Compliance Advice

ASI advises compliance with the following legislation:

- This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, RSO 2005, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation, and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the Ministry stating that there are no further concerns with regards to alterations to archaeological sites by the proposed development.
- It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the Ontario Heritage Act.
- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.
- The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the



Registrar of Cemeteries at the Ministry of Consumer Services is also immediately notified.

- Archaeological sites recommended for further archaeological field work or protection remain subject to Section 48(1) of the Ontario Heritage Act and may not be altered, nor may artifacts be removed from them, except by a person holding an archaeological license.



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Images

6.1 Field Photography



Image 1: Cooksville Creek, disturbed from channelization, no potential.



Image 2: Cooksville Creek, disturbed from channelization, no potential.



Image 3: Cooksville Creek and Camilla Road; Area is disturbed from channelization and bridge construction, no potential.



Image 4: Cooksville Creek, north bank is disturbed from historical creek channelization and realignment, no potential.



Image 5: Cooksville Creek, area is disturbed from historical creek realignment, no potential.



Image 6: Cooksville Creek, disturbed from storm sewers, no potential.

7.0 Maps

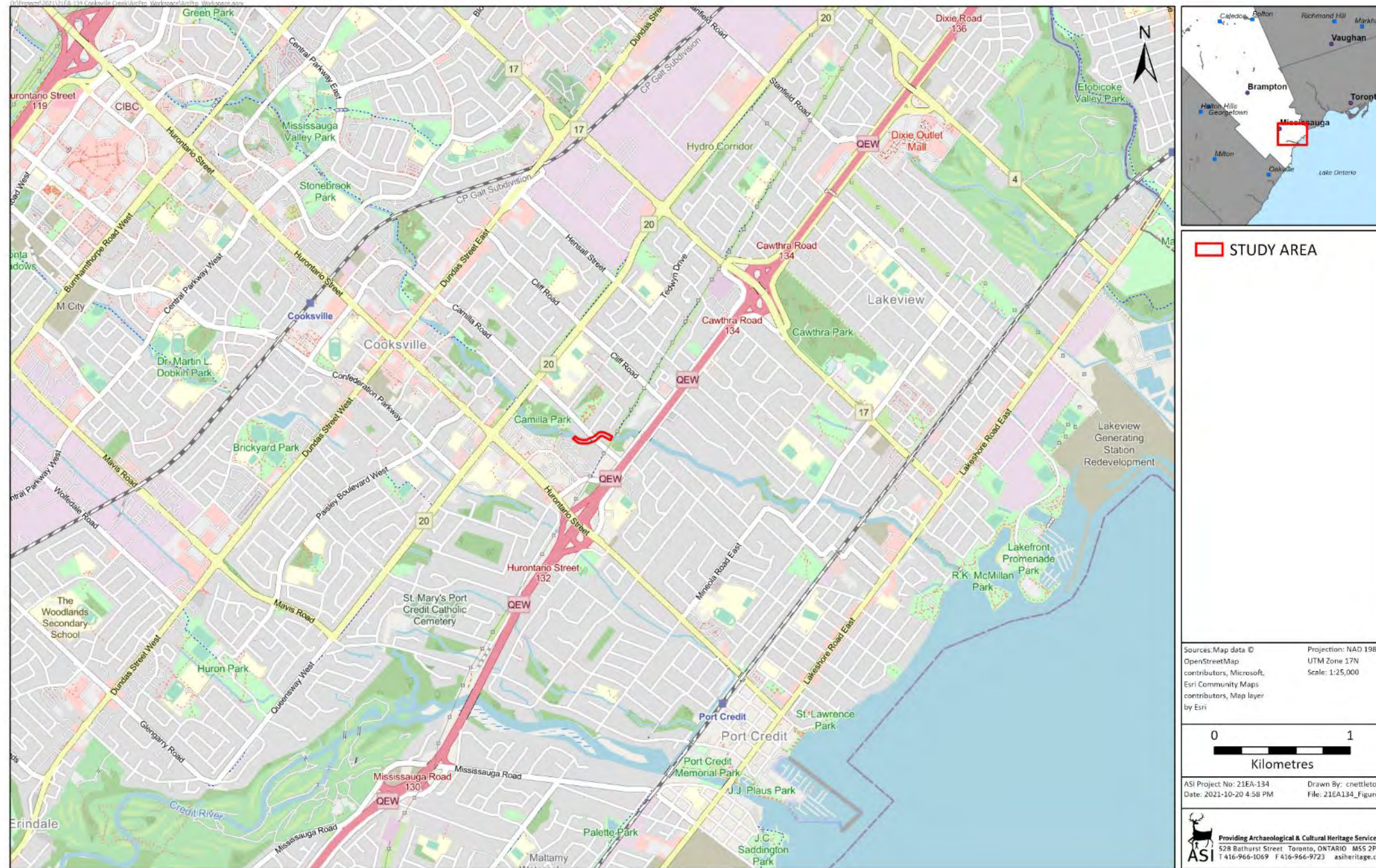


Figure 1: Cooksville Creek Study Area





Figure 2: Study Area (Approximate Location) Overlaid on 1859 Tremaine's Map of the County of Peel

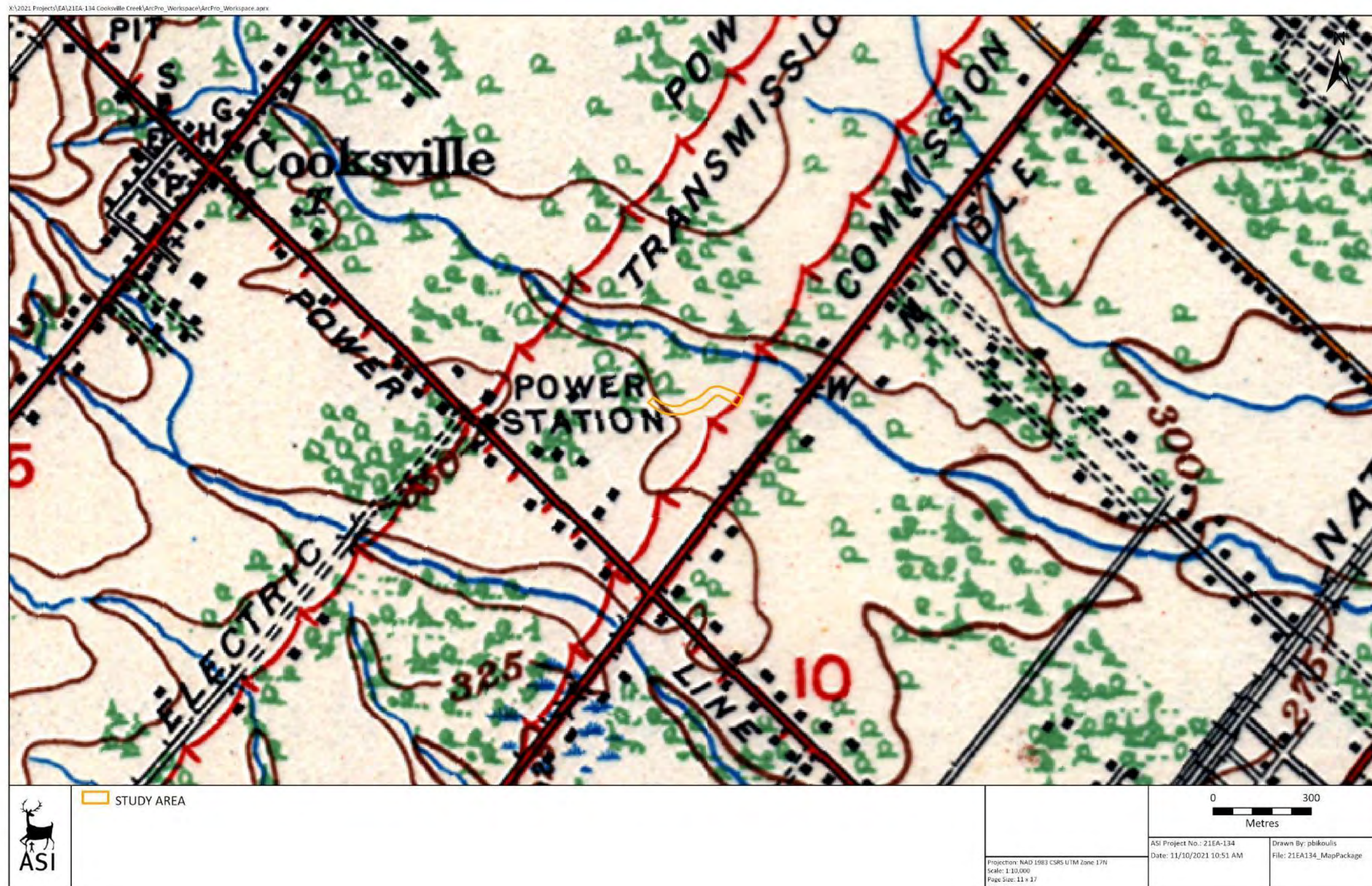


Figure 4: Study Area (Approximate Location) Overlaid on the 1938 Topographic Map of Brampton sheet

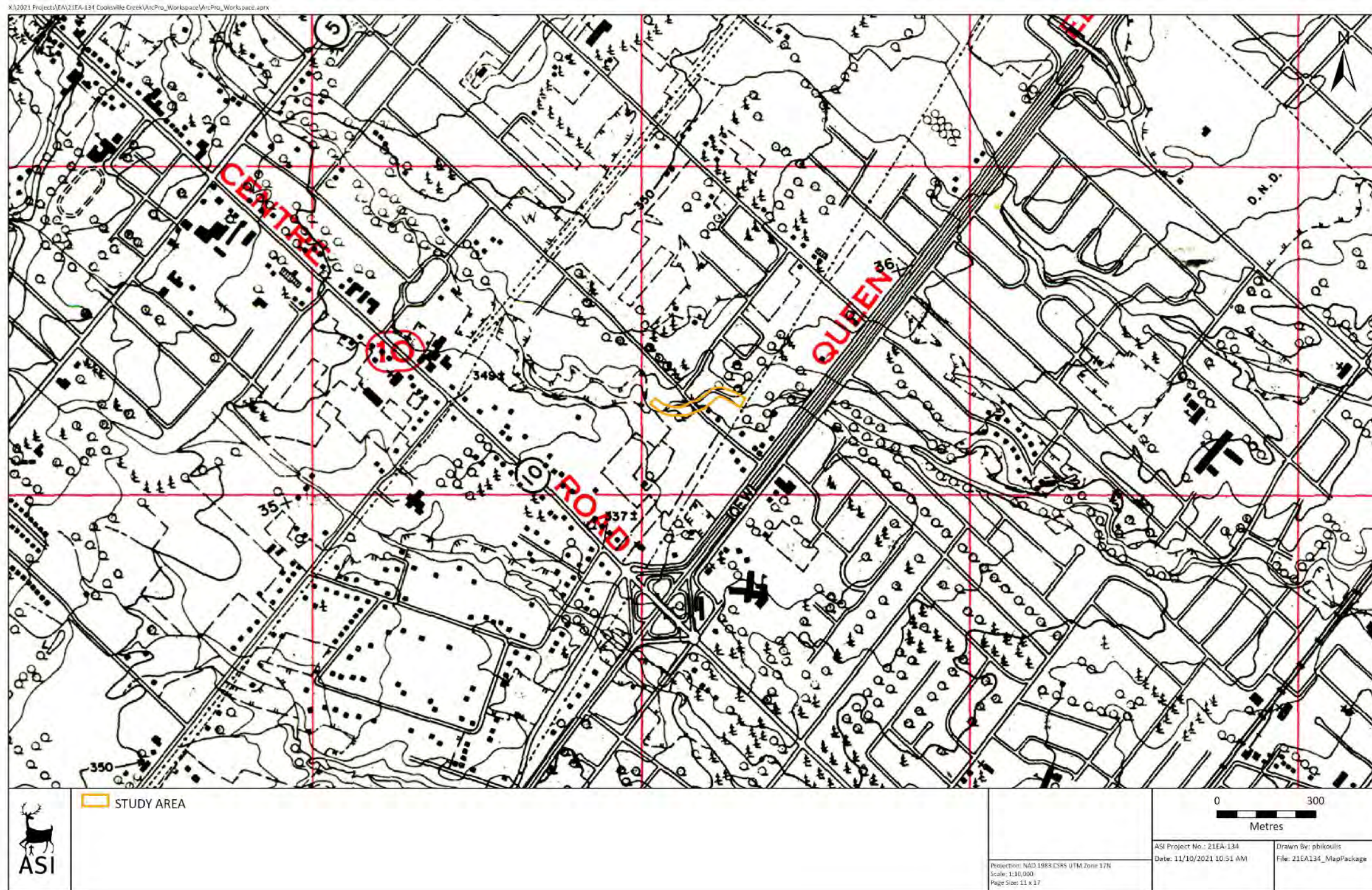


Figure 5: Study Area (Approximate Location) Overlaid on the 1961 National Topographic System Toronto – Port Credit sheet



Figure 6: Study Area (Approximate Location) Overlaid on the 1954 Aerial Photography of Mississauga



Figure 7: Study Area (Approximate Location) Overlaid on the 1966 Aerial Photography of Mississauga



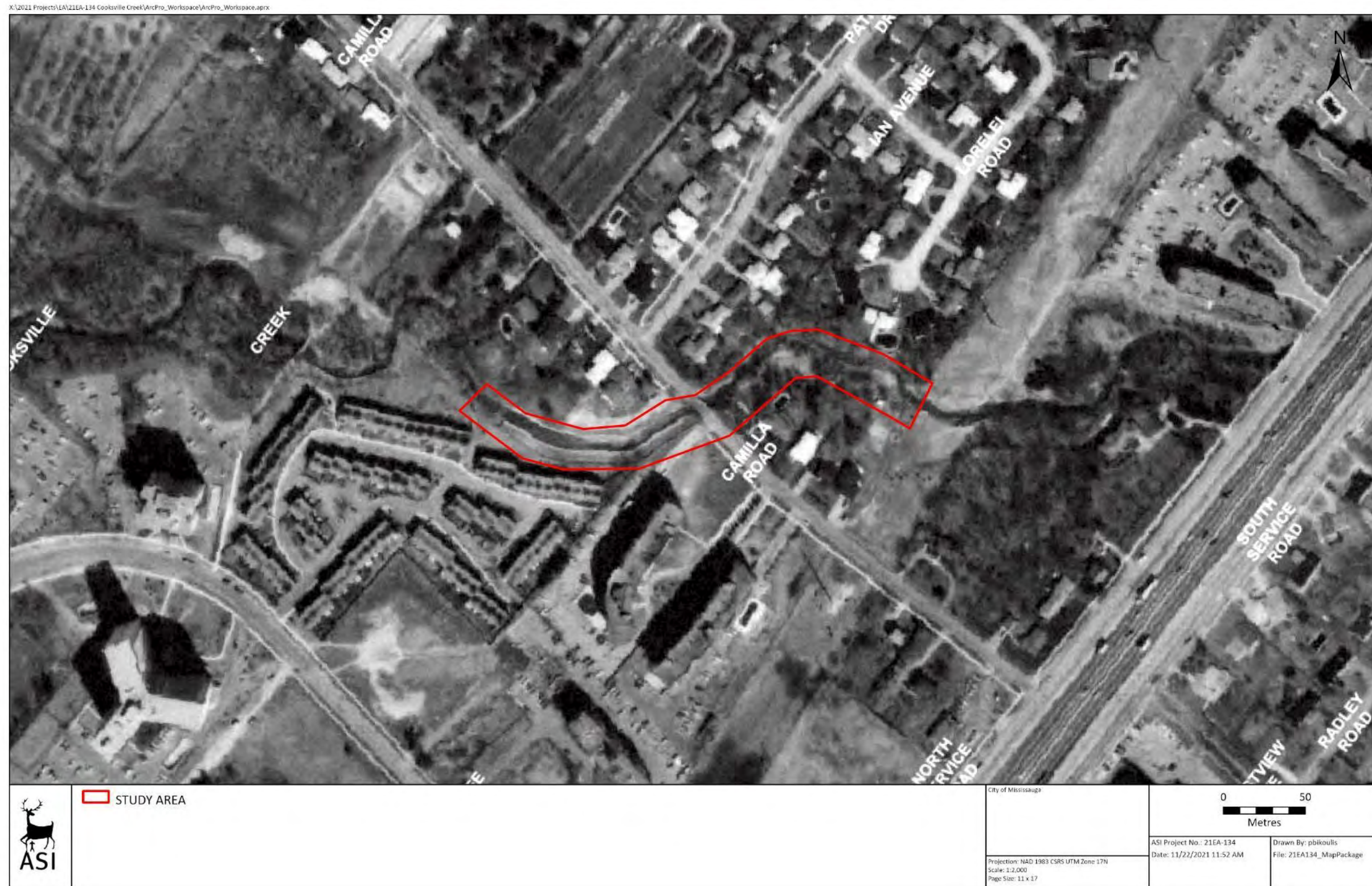


Figure 8: Study Area (Approximate Location) Overlaid on the 1977 Aerial Photography of Mississauga



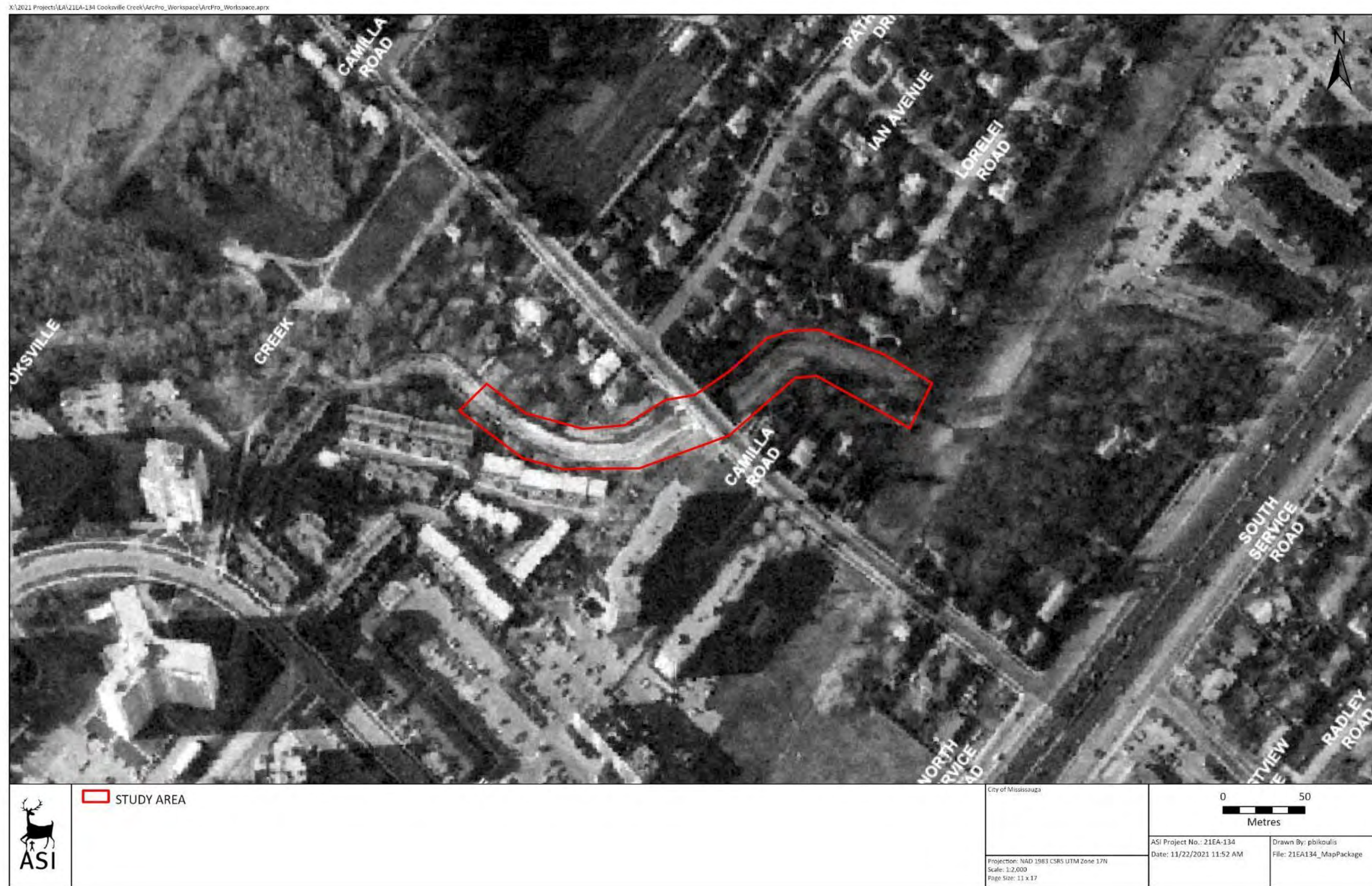


Figure 9: Study Area (Approximate Location) Overlaid on the 1985 Aerial Photography of Mississauga





Figure 10: Surficial Geology





Figure 11: Soil Drainage



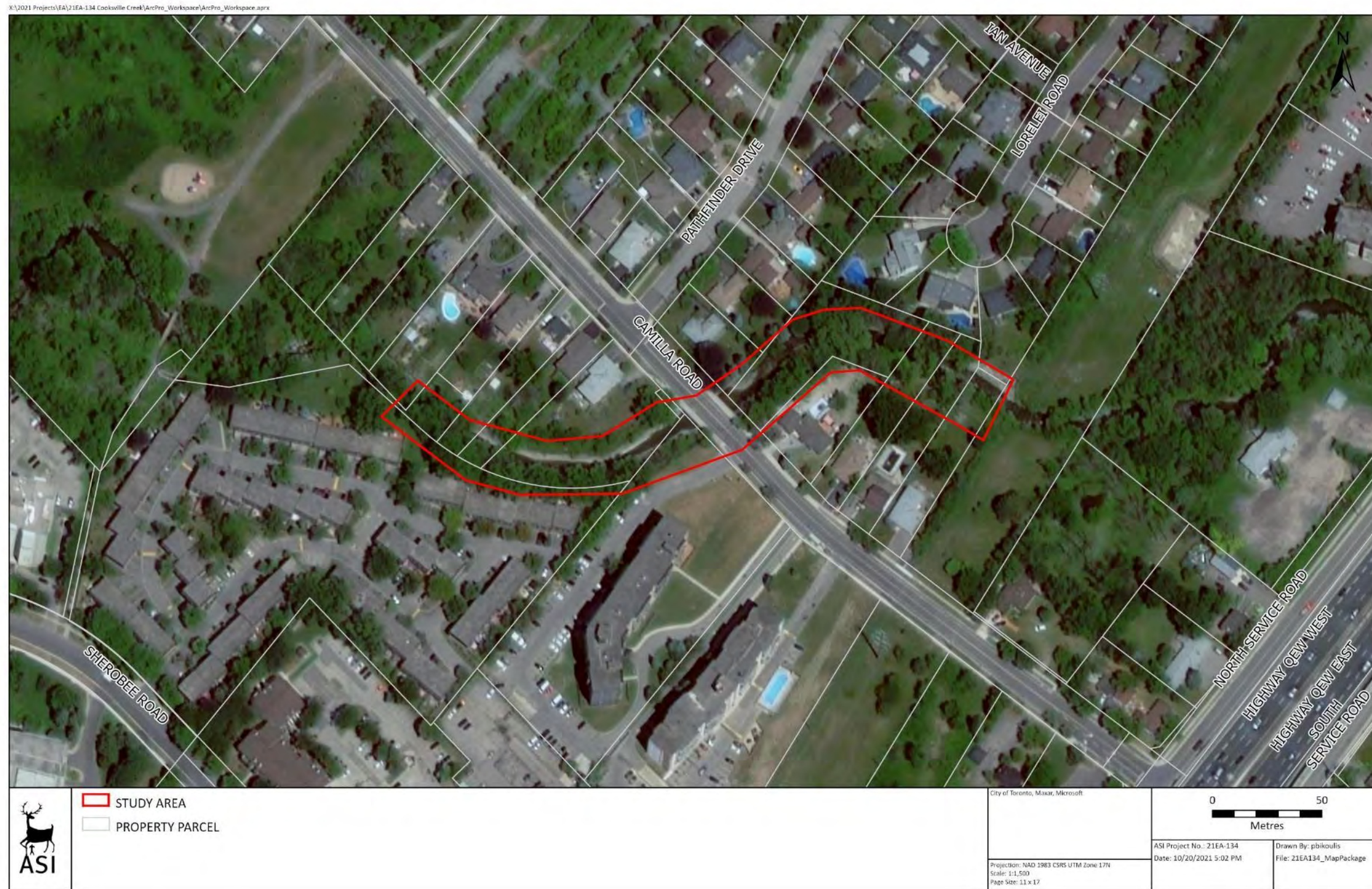


Figure 12: Cooksville Creek Study Area – Existing Conditions and Land Parcels



Figure 13: Cooksville Creek Study Area – Stage 1 Results



Appendix A

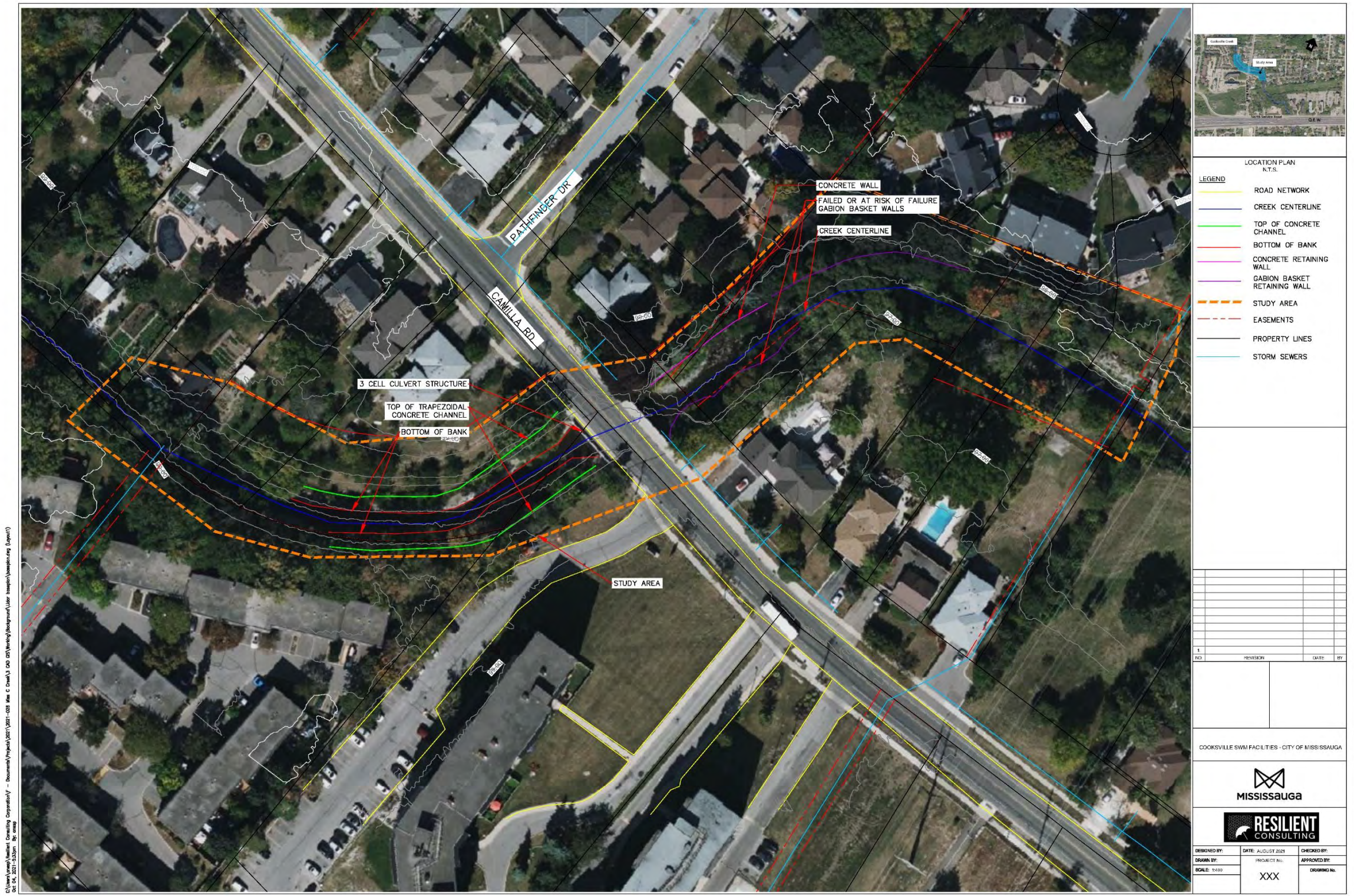


Figure 14: Cookville Creek Base plan



Stage 2 Archaeological Assessment Cooksville Creek Erosion Control Project Part of Lot 14, Concession 1 South of Dundas Street (Geographical Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel

Original Report

Prepared for:

Resilient Consulting

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L1N 5V3

Archaeological Licence: P383 (Williams)

PIF P383-0328-2022

Archaeological Services Inc. File: 21EA-238

27 July 2022



Executive Summary

Archaeological Services Inc. (ASI) was contracted by Resilient Consulting, on behalf of the City of Mississauga, to conduct a Stage 2 Archaeological Assessment for Cooksville Creek Erosion Control, in the City of Mississauga. This project involves developing a restoration design for Cooksville Creek which mitigates existing erosion problems and provides long-term stability to the channel corridor.

A Stage 1 assessment for the Cooksville Creek Erosion Control project was previously completed by ASI in 2021. Background research and a property inspection determined that portions of the Study Area retained archaeological potential and Stage 2 test pit survey was recommended.

The Stage 2 property survey was conducted on June 6, 2022, in accordance with the *Ontario Heritage Act* and the S & G by test pit survey. The entire Study Area was subject to judgemental test pit survey at 10 metre intervals to confirm previous disturbance and gleysolic soil conditions. No archaeological resources were encountered during the Stage 2 survey, and no further archaeological assessment is recommended.



Project Personnel

- **Senior Project Manager:** Lisa Merritt, MSc (P094) Partner, Director, Environmental Assessment Division
- **Division Coordinator:** Katrina Thach, BA Hons (R1225), Associate Archaeologist, Division Coordinator, Environmental Assessment Division
- **Project Administrator:** Catherine Kitchen, BA, Archaeologist, Project Administrator, Environmental Assessment Division
- **Project Director and Project Manager:** Blake Williams, MLitt (P383), Lead Archaeologist, Project Manager, Environmental Assessment Division
- **Field Director:** Hannah Curtis, BA Hons (R1296), Archaeologist, Field Director, Environmental Assessment Division
- **Field Archaeologists:** Williams Glenn, Carly Wilkinson
- **Report Preparation:** Blake Williams
- **Graphics:** Peter Bikoulis, PhD, Archaeologist, GIS Technician, Operation Division; Robin Latour, MPhil, PDip, Associate Archaeologist, Geomatics Specialist, Operations Division; Carolyn Nettleton, BA, Archaeologist, GIS Technician, Operation Division
- **Report Review:** Jessica Lytle, MSc (P1066), Lead Archaeologist, Technical Writer and Fieldwork Coordinator, Environmental Assessment Division; Lisa Merritt



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1.0 Project Context

Archaeological Services Inc. (ASI) was contracted by Resilient Consulting, on behalf of the City of Mississauga to conduct a Stage 2 Archaeological Assessment as part of the Cooksville Creek Erosion Control project (Figure 1). This project involves developing a restoration design for Cooksville Creek which mitigates existing erosion problems and provides long-term stability to the channel corridor.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (*Ontario Heritage Act*, R.S.O. c. O.18, 1990, as amended in 2021) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism and Culture (MTC, 2011).

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (*Environmental Assessment Act*, R.S.O., 1990 as amended 2021) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (*Municipal Class Environmental Assessment*, 2000, as amended 2015).

In addition, this Stage 2 assessment has been commissioned to satisfy the recommendations of the previous Stage 1 assessment undertaken by ASI that was undertaken as part of the Cooksville Creek Erosion Control project in the City of Mississauga (2021).

ASI has been actively engaging with Indigenous communities who have expressed an interest in the archaeological work within the Study Area for this project on behalf of the City of Mississauga. A representative from the Haudenosaunee Development Institute was present on site and participated during the Stage 2 property survey. No concerns were expressed during the



execution of the fieldwork. A detailed account of all First Nations engagement can be found in the *Supplementary Documentation: Indigenous Engagement* document associated with this report.

Authorization to access and carry out all activities necessary for the completion of this Stage 2 assessment was granted by Resilient Consulting on February 14, 2022.

1.1.1 Treaties and Traditional Territories

The Study Area is within Treaty 13a, signed on August 2, 1805, by the Mississaugas and the British Crown in Port Credit at the Government Inn. A provisional agreement was reached with the Crown on August 2, 1805, in which the Mississaugas ceded 70,784 acres of land bounded by the Toronto Purchase of 1787 in the east, the Brant Tract in the west, and a northern boundary that ran six miles back from the shoreline of Lake Ontario. The Mississaugas also reserved the sole right of fishing at the Credit River and were to retain a one-mile strip of land on each of its banks, which became the Credit Indian Reserve. On September 5, 1806, the signing of Treaty 14 confirmed the Head of the Lake Purchase between the Mississaugas of the Credit and the Crown (Mississauga of the New Credit First Nation, 2001; Mississaugas of the Credit First Nation, 2017).

1.2 Historical Context

A comprehensive review of the precontact Indigenous and Euro-Canadian occupations of the Regional Municipality of Peel is presented in the Stage 1 report (ASI 2021). To summarize, background research indicates that the general vicinity of the Study Area has been attractive to human settlement for thousands of years, primarily by Indigenous people and more recently by Euro-Canadian settlers. Historically, the Study Area corridor is within Lot 14, Concession 1 South of Dundas Street in the Geographical Township of Toronto, City of Mississauga, Regional Municipality of Peel, Ontario.



1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MHSTCI through *Ontario's Past Portal*; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

The Study Area comprises a small section along Cooksville Creek east of Camilla Road, south of Pathfinder Drive in the City of Mississauga. The Study Area is located in a scrubby area adjacent to Cooksville Creek and surrounded by low density residential buildings. The Study Area is approximately 28 metres long by eight metres wide.

The Stage 2 survey for the Cooksville Creek Erosion Control project was conducted on June 6, 2022, under the field direction of Hannah Curtis (R1296).

1.3.2 Geography

A comprehensive summary of the geology and physiography of the Regional Municipality of Peel is presented in the Stage 1 report (2021, pp. 13–14). To summarize, the Study Area is situated within the Iroquois Plain of the physiographic region of southern Ontario (Chapman & Putnam, 1984). The Iroquois Plain physiographic region of Southern Ontario is a lowland region bordering Lake Ontario. This region is characteristically flat, and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, a body of water that existed during the late Pleistocene. This region extends from the Trent River, around the western part of Lake Ontario, to the Niagara River, spanning a distance of 300 kilometres (Chapman and Putnam 1984:190). The old shorelines of Lake Iroquois include cliffs, bars, beaches and boulder pavements. The old sandbars in this region are good aquifers that supply



water to farms and villages. The gravel bars are quarried for road and building material, while the clays of the old lake bed have been used for the manufacture of bricks (Chapman and Putnam 1984:196).

The Study Area is made up of well drained soils (2021, p. 39; Figure 11). The majority is composed of bottom land; an alluvial soil with clay, silt, gravel and may contain organic remains (2021, p. 38; Figure 10).

The Study Area is also located within the Cooksville Creek watershed which drains an area of approximately 33.9 square kilometres. Cooksville Creek originates in the City of Mississauga near Hurontario Street and Britannia Road and flows south to meet its confluence with Lake Ontario in the Lake Iroquois Plain physiographic region west of Cawthra Road (Aquafor Beech Ltd., 2012).

1.3.3 Previously Registered Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database maintained by the MHSTCI. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 kilometres east to west, and approximately 18.5 kilometres north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AjGv*.

According to the Ontario Archaeological Sites Database, three previously registered archaeological sites are located within one kilometre of the Study Area, none of which are located within 50 metres (MHSTCI 2022). A summary of the sites is provided below.



Table 1: Registered Sites within One Kilometre of the Study Area

Borden Number	Site Name	Temporal/Cultural Affiliation	Site Type	Researcher
AjGv-2	Murphy	Unknown	Unknown	Konrad 1971
AjGv-6	Geveny	Archaic	Campsite	Unknown 1971
AjGv-12	Pinewood Trail	Unknown	Unknown	Unknown 1971

1.3.4 Previous Archaeological Assessments

According to the background research, one previous report details fieldwork within 50 metres of the Study Area.

Reports within the Study Area

(ASI 2021) Stage 1 Archaeological Assessment Cooksville Creek Erosion Control at Camilla Road (Lot 14-15, Concession 1 South of Dundas Street, Former Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel. P1066-0257-2021. ASI file 21EA-134.

ASI conducted a Stage 1 assessment as part of the Cooksville Creek Erosion Control project, which overlaps with the current Study Area. This assessment noted that while the majority of the project area did not retain archaeological potential, the current Study Area did exhibit archaeological potential. Stage 2 test pit survey was recommended.

2.0 Field Methods

The Stage 2 Study Area comprises the lands located behind low density residential buildings east of Camilla Road and south of Pathfinder Drive in the



City of Mississauga (Figure 1). It measures approximately 28 metres by eight metres in size and covers an area of 196 square meters (Figure 2).

The Stage 2 property survey was conducted under the field direction of Hannah Curtis (R1296) on June 6, 2022, in accordance with the *Ontario Heritage Act* and the S & G, Section 2. During the field assessments, weather and lighting conditions permitted good visibility and were in accordance with the S & G, Section 2.1, Standard 3. During the time of survey, conditions were seasonal with overcast skies and temperatures of 20 degrees Celsius. Photographs of all field conditions were taken (Images 1-5), and the location and direction of each photograph is mapped in Figure 2.

As per Section 2.1 of the S & G, all lands were within areas where ploughing was not possible or viable and therefore subject to test pit survey. According to Section 2.1.2, Standard 2 of the S & G, any undisturbed areas requiring test pit survey within 300 metres of any feature of archaeological potential must be subject to systematic assessment at five metre intervals. Test pits were placed at five metre intervals until disturbance or gleysolic soil profiles were encountered, and then judgmentally increased to ten metres intervals as per S & G Section 2.1.8. All test pits were excavated following the S & G Section 2.1.2 Standards 5-9. All test pits were excavated by hand to a minimum of 30 centimetres in diameter and into the first five centimetres of subsoil. Each test pit was examined for stratigraphy, cultural features, and evidence of fill. Test pit fill was screened through six-millimetre mesh to facilitate artifact recovery. Afterwards, all test pits were backfilled, and their locations were recorded on field maps. Any factors that precluded the excavation of test pits (e.g., excessive slope, drainage, exposed bedrock, previous disturbance) were noted, and the areas were mapped and photographed.

Fieldwork was conducted using a Samsung Galaxy S4 tablet running Esri Collector software equipped with a sub-metre Trimble Catalyst Global Navigation Satellite System in conjunction with project mapping provided by Resilient Consulting to ensure the assessment remained within the Study Area limits.



2.1 Test Pit Survey

The entire Study Area was subject to judgmental test pit survey at 10 metre intervals due to variable topsoil integrity caused by previous disturbance and permanently low and wet conditions resulting in gleysolic soil profiles.

Approximately 76.5 percent of the Study Area (150 square metres) demonstrated archaeological potential and was subject to judgmental test pit survey at 10 metre intervals to confirm previous disturbance following S & G Section 2.1.8, Standards 1-2. The disturbance encountered can be attributed to the construction of a buried retaining wall (Figure 2; Images 1-2, 4). Disturbed stratigraphy in the Study Area is characterized by 100 centimetres of dark grayish brown (10YR 4/2) silt sand fill containing gravel, brick, glass and plastic (Image 4).

The remaining 23.5 percent of the Study Area (46 square metres) was found to contain gleysolic soil profiles and was subject to judgmental test pit survey at 10 metre intervals to confirm permanently low and wet conditions associated with the proximity of Cooksville Creek (Figure 2; Images 6, 5). The gleysolic soil stratigraphy in the Study Area is characterized by approximately 12 centimetres of very dark brown (10YR 2/2) silty clay topsoil (A-horizon) overlying 28 centimetres of gray (10YR 5/1) silty clay gleysolic soil which was streaked with rusty orange inclusions (Image 4).

Gleysolic soils result from prolonged water saturation of the soil profile (Chapman and Putnam 1984:150). Landscapes with clay-dominated soil textures have very slow rates of water movement through the soil which causes water saturation. Water saturation leads to depletion of oxygen in the soil and soil features associated with oxygen-depleted conditions. These conditions cause the transformation of metals, such as iron, and lead to changes in the dominant colour of soil horizons. When oxygen becomes depleted (due to water saturation) the iron is reduced and takes on a blue-gray hue and this dominates the colour of the horizon. Reduced iron is also mobile and it can concentrate in the profile and re-oxidize, producing reddish or brown mottles. These features are collectively referred to as gley features, and the diagnostic criteria for



gleysolic soils in the presence of well-developed gley features within 50 centimetres of the soil surface (University of Saskatchewan, 2021).

2.2 Stage 2 Assessment Results Summary

A summary of the Stage 2 assessment results for the Cooksville Creek Erosion Control Project can be found in Table 2 below.



Table 2: Stage 2 Survey Results Summary

Survey Method	Area	Description	Images
Judgmental test pit survey; 10 metre intervals	150 square metres (76.5 percent)	Construction fill associated with installation of buried retaining wall	1-2, 4
Judgmental test pit survey; 10 metre intervals	46 square metres (23.5 percent)	Scrubland; gleysolic soil profiles	3, 5

3.0 Record of Finds

No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the Cooksville Creek Erosion Control project.

3.1 Inventory of Documentary and Material Record

The documentation related to this archaeological assessment will be curated by ASI until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the MHSTCI, and any other legitimate interest groups.

Table 3 provides an inventory and location of the documentary and material record for the project in accordance with the S & G, Sections 6.7 and 7.8.2.3.



Table 3: Inventory of Documentary and Material Record

Material	Location	Comments
Digital field notes, field maps, GPS logs, etc.	Archaeological Services Inc., 528 Bathurst Street, Toronto, Ontario, M5S 2P9	Stored in ASI project folder 21EA-238; GPS and digital information stored on ASI network servers
Digital field photography	Same as above	Files stored on ASI network servers
Digital research, analysis, and reporting materials	Same as above	Files stored on ASI network servers

4.0 Analysis and Conclusions

ASI was contracted by Resilient Consulting, on behalf of the City of Mississauga, to conduct a Stage 2 Archaeological Assessment for Cooksville Creek Erosion Control, in the City of Mississauga (Figure 1). This project involves developing a restoration design for Cooksville Creek which mitigates existing erosion problems and provides long-term stability to the channel corridor.

A Stage 1 assessment for the Cooksville Creek Erosion Control project was previously completed by ASI in 2021. Background research and a property inspection determined that portions of the Study Area retained archaeological potential and Stage 2 test pit survey was recommended.

The Stage 2 property survey was conducted on June 6, 2022, in accordance with the *Ontario Heritage Act* and the S & G by test pit survey. The entire Study Area was subject to judgmental test pit survey at 10 metre intervals to confirm previous disturbance and gleysolic soil profiles associated with permanently low and wet conditions. Approximately 76.5 percent of the Study Area (150



square metres) was documented to have been previously disturbed by retaining wall construction, while the remaining 23.5 percent (46 square metres) demonstrated gleysolic soil profiles due to the proximity of Cooksville Creek (Figure 2; Images 1-2, 4). No archaeological resources were encountered during the Stage 2 survey, and no further archaeological assessment is recommended.

5.0 Recommendations

In light of these results, the following recommendations are made:

1. The Study Area does not require further archaeological assessment; and
2. Should the proposed work extend beyond the current Study Area, or should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to a Stage 2 archaeological assessment.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Archaeology Programs Unit of the MHSTCI should be immediately notified.

The above recommendations are subject to Ministry approval, and it is an offence to alter any archaeological site without MHSTCI concurrence. No grading or other activities that may result in the destruction or disturbance of any archaeological sites are permitted until notice of MHSTCI approval has been received.

6.0 Legislation Compliance Advice

ASI advises compliance with the following legislation:



- This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 2005, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation, and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the Ministry stating that there are no further concerns with regards to alterations to archaeological sites by the proposed development.
- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.
- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.
- The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Consumer Services is also immediately notified.



- Archaeological sites recommended for further archaeological field work or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, nor may artifacts be removed from them, except by a person holding an archaeological license.



7.0 Bibliography and Sources

- Aquafor Beech Ltd. (2012). *Cooksville Creek Flood Evaluation Master Plan EA*.
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- Municipal Class Environmental Assessment, (2000).
- University of Saskatchewan. (2021). *Gleysolic*. Soils of Canada. <https://soilsofcanada.ca/orders/gleysolic.php>



8.0 Images



8.1 Field Photography



Image 1: Buried retaining wall and dumped modern refuse; area subject to judgmental test pit survey at 10 metre intervals.



Image 2: Judgmental test pit survey at 10 metre intervals in progress.



Image 3: Judgemental test pit survey at 10 metre intervals in progress.



Image 4: Disturbed test pit profile.



Image 5: Test pit profile showing natural stratigraphy with gleysolic profile.

9.0 Maps



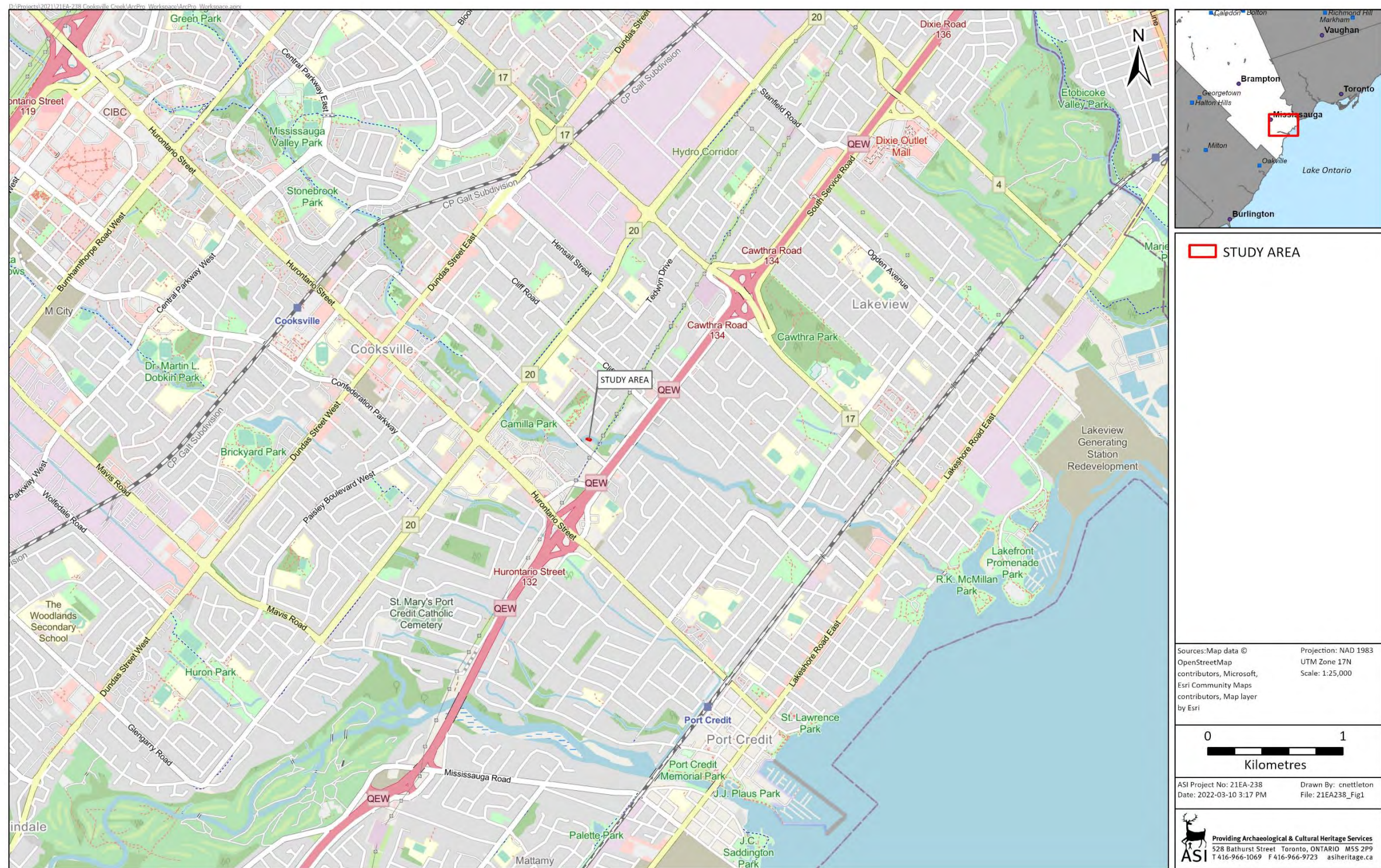


Figure 1: Location of the Study Area



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Figure 2: Stage 2 Archaeological Assessment Results for the Cooksville Creek Erosion Control



APPENDIX C

Hydraulic Analysis

MEMORANDUM
August 28, 2023

TO: Anthony Di Giandomenico P.Eng., City of Mississauga
FROM: Adam Nespolo, Resilient Consulting
Cc: Mark Bassingthwaite, Resilient Consulting

SUBJECT: Technical Memorandum
Cooksville Creek Erosion Control at Camilla Road
Hydraulic Analysis



1 Introduction

The City of Mississauga (the City) has retained Resilient Consulting Corporation (Resilient) to undertake a Municipal Class Environmental Assessment (Class EA) and complete a detailed design for the Cooksville Creek Erosion Project at Camilla Road in the City of Mississauga. The goal of the Cooksville Creek Erosion Project was to develop a restoration design for Cooksville Creek that mitigates existing erosion problems and provides long term stability to the channel corridor. Resilient has completed a hydraulic analysis in support of the design and permit applications.

2 Background Information

Several documents were reviewed during the preparation of this report:

- Cooksville Creek Watershed Flood Hazard Map Sheet 3, provided by CVC; and,
- Cooksville Creek FHM 2yr-100yr and Regional HEC-RAS model, provided by CVC, completed in February 2020, obtained from the CVC in 2022.

Resilient's scope of work includes the review of the HEC-RAS model for Cooksville Creek and evaluating the proposed channel restoration hydraulic conditions. The HEC-RAS model update by Resilient will confirm the hydraulic effects of the proposed rehabilitation and that there is no increase to flood risk associated with the work. Resilient will also provide temporary crossing sizing recommendations for access to the work area for the project.

2.1 Consultations with CVC

Resilient had three (3) consultation meetings with CVC to discuss the hydraulic modeling for this project. The meetings took place on the following dates:

- October 06, 2022
- December 06, 2022
- August 16, 2023

A summary of each meeting is provided below.

October 06, 2022: During this meeting, Resilient discussed how the preferred option was resulting in model instability concerns downstream of Camilla Road associated to the new cross-

section downstream of the crossing within the 1D HEC-RAS model. CVC suggested removing the newly added cross sections to assess if the 1D model achieves stability.

December 06, 2022: During this meeting, Resilient addressed the ongoing issue of inconsistent water surface elevations through the 1D modelling. Resilient provided an overview of various scenarios that had been tested, and the team decided to update CVC's existing 2D model to assess the impact of the proposed project works.

August 16, 2023: During this meeting, Resilient discussed the inconsistent 2D model results and recent hydraulic 1D model updates based on using a hybrid approach where a portion of the concrete channel is retained to function as a hydraulic apron (further described in subsequent sections of the memo). This approach works on site with potential property issues, and was found to offer superior model results. CVC accepted Resilient's proposed design alteration.

3 Existing Conditions

The project area consists of approximately 200m of the Cooksville Creek at the Camilla Road crossing.

The following sections summarize the hydraulic analysis completed for the existing channel and the proposed erosion restoration.

4 Hydraulic Analysis

To assess existing and proposed water surface elevations experienced in Cooksville Creek, a hydraulic analysis was completed for the study area.

4.1 Existing Conditions

Resilient requested and received the Cooksville Creek HEC-RAS models from CVC in 2021. The model was reviewed by Resilient and found to be reflective of existing conditions. The study area is located on River "Cooksville Creek" Reach "2211" in the model and between River Station (RS) 13382 and RS 13253. Resilient also reviewed the surrounding cross sections through Cooksville Creek. Resilient reviewed the following aspects of the model:

- Cross section Manning's N,
- Bounding cross sections geometry,
- Expansion and Contraction coefficients,
- Ineffective flow areas,
- Bridge/culvert coding in HEC RAS (piers, deck, etc.), and;
- General modelling approach (orientation, Energy/Momentum methods).

The existing model was run to determine the water surface elevations (WSE) through the channel and in the surrounding cross sections. The future flow model results for the 2 Year, 5 Year, 10 Year, 25 Year, 50 Year, 100 Year and Regional events are summarized in Table 1.

Table 1. CVC Future Conditions 2, 5, 10, 25, 50 and 100 Year and Regional Water Surface Elevations

CVC Future Flows Model							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13598 (U)	99.78	100.23	100.6	100.78	101.08	101.27	101.88
13590 (U)	99.57	99.84	100.14	100.35	100.95	101.13	101.75
13565 (U)	99.49	99.8	99.97	100.1	100.15	100.47	100.82
13510 (U)	99.09	99.54	99.8	99.98	100.13	99.99	100.91
13445 (U)	97.79	98.11	99.44	99.67	99.79	99.86	100.19
13382	98.21	98.89	99.47	99.71	99.83	99.91	99.98
13329	98.2	98.87	99.46	99.7	99.83	99.92	99.99
13307	98.02	98.59	99.06	99.37	99.57	99.7	99.97
13253	97.81	98.4	98.84	99.08	99.28	99.44	99.83
13189 (D)	97.61	98.36	98.86	99.14	99.33	99.47	99.81
13143 (D)	97.22	98.34	98.85	99.14	99.33	99.47	99.81
13135 (D)	96.96	98.31	98.84	99.13	99.32	99.46	99.8
13104 (D)	96.91	98.31	98.84	99.13	99.32	99.46	99.8
13052 (D)	96.79	98.28	98.81	99.1	99.29	99.42	99.77

U = located upstream of site

D = located downstream of site

RS 13382, 13307 and 13253 channel geometries were updated with surveyed topographic information to better reflect existing conditions. Furthermore, the ineffective flow area at RS 13253 was reduced to better reflect the flow behaviour. Resilient's future flow model results for the 2 Year, 5 Year, 10 Year, 25 Year, 50 Year, 100 Year and Regional events are summarized in Table 2. The full existing condition WSE's can be found in Attachment 1.

Table 2. Resilient Existing under Future Conditions Water Surface Elevations

Resilient Future Flows Update							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13598 (U)	99.78	100.23	100.6	100.78	101.08	101.27	101.88
13590 (U)	99.57	99.84	100.14	100.35	100.95	101.13	101.75
13565 (U)	99.49	99.8	99.97	100.1	100.15	100.47	100.82

Resilient Future Flows Update							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13510 (U)	99.09	99.54	99.8	99.98	100.13	99.99	100.91
13445 (U)	97.79	98.11	99.34	99.59	99.71	99.78	100.19
13382	98.15	98.84	99.37	99.63	99.75	99.83	99.91
13329	98.14	98.82	99.34	99.63	99.75	99.84	99.94
13307	97.95	98.53	98.96	99.24	99.42	99.56	99.91
13253	97.83	98.48	98.96	99.23	99.42	99.56	99.91
13189 (D)	97.61	98.36	98.86	99.14	99.32	99.46	99.79
13143 (D)	97.22	98.34	98.85	99.14	99.32	99.46	99.8
13135 (D)	96.96	98.31	98.84	99.13	99.31	99.44	99.79
13104 (D)	96.91	98.31	98.84	99.13	99.31	99.44	99.79
13052 (D)	96.79	98.28	98.81	99.1	99.28	99.41	99.75

4.2 Proposed Conditions

The proposed design upstream of the Camilla Road bridge involves removing majority of the concrete channel and replacing it with an armourstone lined channel. However, approximately 30m of the concrete channel, immediately upstream of the bridge, will be retained and repaired to serve as a hydraulic apron, facilitating the flow into the bridge. It should be noted that the concrete channel along the south bank, located approximately 22 m west of Camilla Road, cannot be repaired until a private property access agreement is obtained. The bottom of the bank will be widened by 3.1 m. This portion of the channel is to remain to improve hydraulic conveyance of the existing Camilla Road bridge. A portion of this area is also located on 2100 Camilla Road property that the City has not been able to secure a permission to enter agreement with the property owner.

In the downstream section of the Camilla Road bridge, the proposed design involves replacing of the failed Gabion basket wall with an armourstone wall on the north bank. The existing Gabion bank protection and leaning interlocking wall will be removed and replaced with a vegetated rock buttress on the south bank. Furthermore, the bottom of the bank will be widened, with the widths ranging from 2.5 m to 3.5 m.

To assess the impact of the proposed restoration design on water surface elevations experienced in the Cooksville Creek, the existing HEC-RAS model cross sections passing through the site were updated to reflect the new channel geometry. Resilient's proposed future flow model results for the 2 Year, 5 Year, 10 Year, 25 Year, 50 Year, 100 Year and Regional events are summarized in Table 3. The full proposed condition WSE's can be found in Attachment 2.

Table 3. Resilient Proposed under Future Conditions Water Surface Elevations

Resilient Proposed - Future Flows							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13598 (U)	99.78	100.23	100.6	100.78	101.08	101.27	101.88
13590 (U)	99.57	99.84	100.14	100.35	100.95	101.13	101.75
13565 (U)	99.49	99.8	99.97	100.1	100.15	100.47	100.82
13510 (U)	99.09	99.54	99.8	99.98	100.13	99.99	100.91
13445 (U)	97.79	98.11	99.25	99.53	99.64	99.7	100.19
13382	98.09	98.8	99.33	99.6	99.72	99.8	99.81
13329	98.08	98.79	99.32	99.61	99.75	99.83	99.91
13307	97.86	98.48	98.93	99.23	99.41	99.54	99.88
13253	97.78	98.45	98.93	99.2	99.38	99.52	99.87
13189 (D)	97.61	98.36	98.86	99.14	99.32	99.46	99.79
13143 (D)	97.22	98.34	98.85	99.14	99.32	99.46	99.8
13135 (D)	96.96	98.31	98.84	99.13	99.31	99.45	99.79
13104 (D)	96.91	98.31	98.84	99.13	99.31	99.44	99.79
13052 (D)	96.79	98.28	98.81	99.1	99.28	99.41	99.75

The differences between the proposed and existing water surface elevations under the future flows conditions are shown in Table 4. It is noted that no WSE increases greater than 1 cm are experienced during the 2-100 year and Regional events. This is likely due to rounding in the model, and is not considered a significant change.

Table 4. Water Surface Elevation Comparison under Future Conditions

WSE Difference for Future Flows: Resilient Proposed - Resilient Existing							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13598 (U)	0	0	0	0	0	0	0
13590 (U)	0	0	0	0	0	0	0
13565 (U)	0	0	0	0	0	0	0
13510 (U)	0	0	0	0	0	0	0
13445 (U)	0	0	-0.09	-0.06	-0.07	-0.08	0

WSE Difference for Future Flows: Resilient Proposed - Resilient Existing							
Section #	2 Year W.S.E. (m)	5 Year W.S.E. (m)	10 Year W.S.E. (m)	25 Year W.S.E. (m)	50 Year W.S.E. (m)	100 Year W.S.E. (m)	Regional W.S.E. (m)
13382	-0.06	-0.04	-0.04	-0.03	-0.03	-0.03	-0.1
13329	-0.06	-0.03	-0.02	-0.02	0	-0.01	-0.03
13307	-0.09	-0.05	-0.03	-0.01	-0.01	-0.02	-0.03
13253	-0.05	-0.03	-0.03	-0.03	-0.04	-0.04	-0.04
13189 (D)	0	0	0	0	0	0	0
13143 (D)	0	0	0	0	0	0	0
13135 (D)	0	0	0	0	0	0.01	0
13104 (D)	0	0	0	0	0	0	0
13052 (D)	0	0	0	0	0	0	0

Figures 1 to 5 below show a comparison between the existing and proposed cross sections and profile view in the study area, as well as the Future 100-year and Future Regional WSE. At Cross Section 13382, the bottom of the channel will be widened by approximately 3.1 m, and the banks will be reinforced with armourstone. Cross Section 13329 will be repaired and maintained as a hydraulic apron. At Cross Section 13307 the bottom of the channel will be widened by approximately 2.5 meters on the south end, with vegetated rock buttresses implemented along the banks. Similarly, at Cross Section 13253, the channel bottom will be widened by 3.5 meters on the south end, and vegetated rock buttresses along the banks.

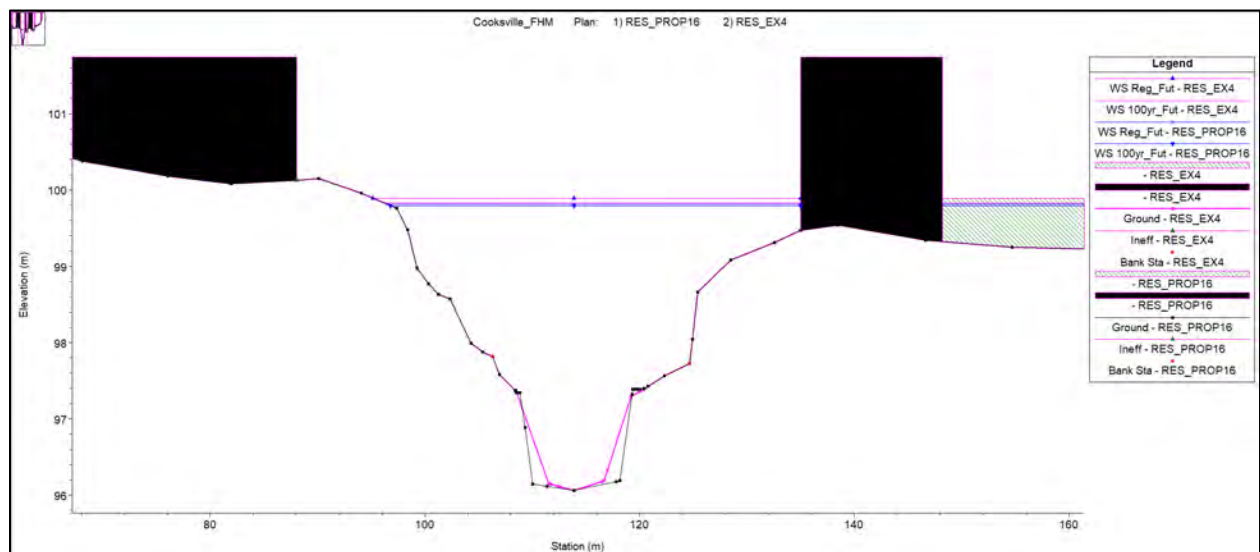


Figure 1. Existing and Proposed Cross Section 13382

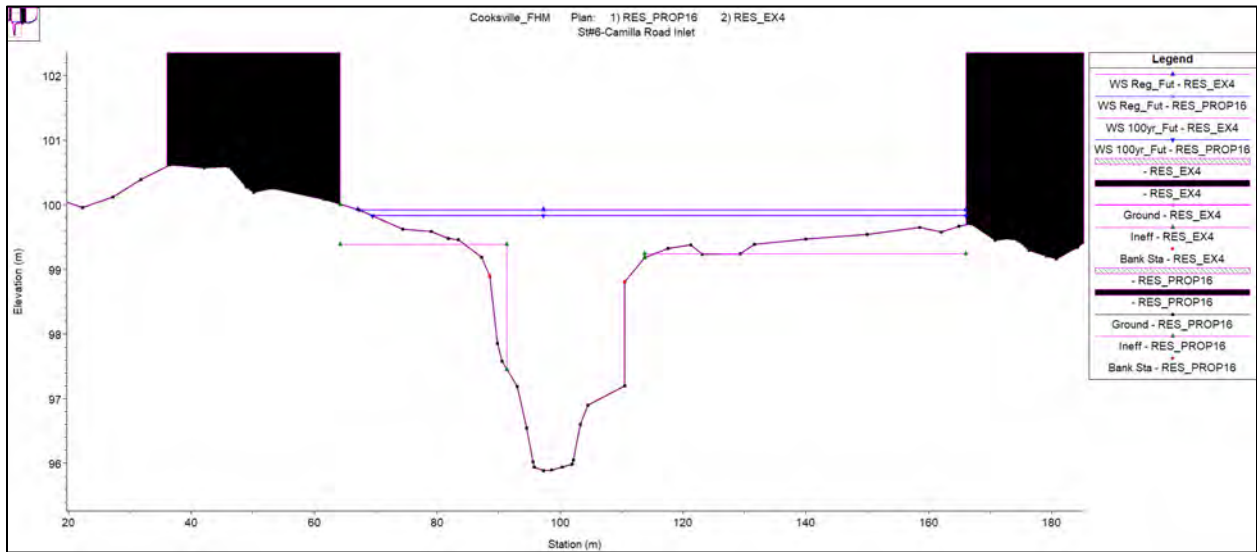


Figure 2. Existing and Proposed Cross Section 13329

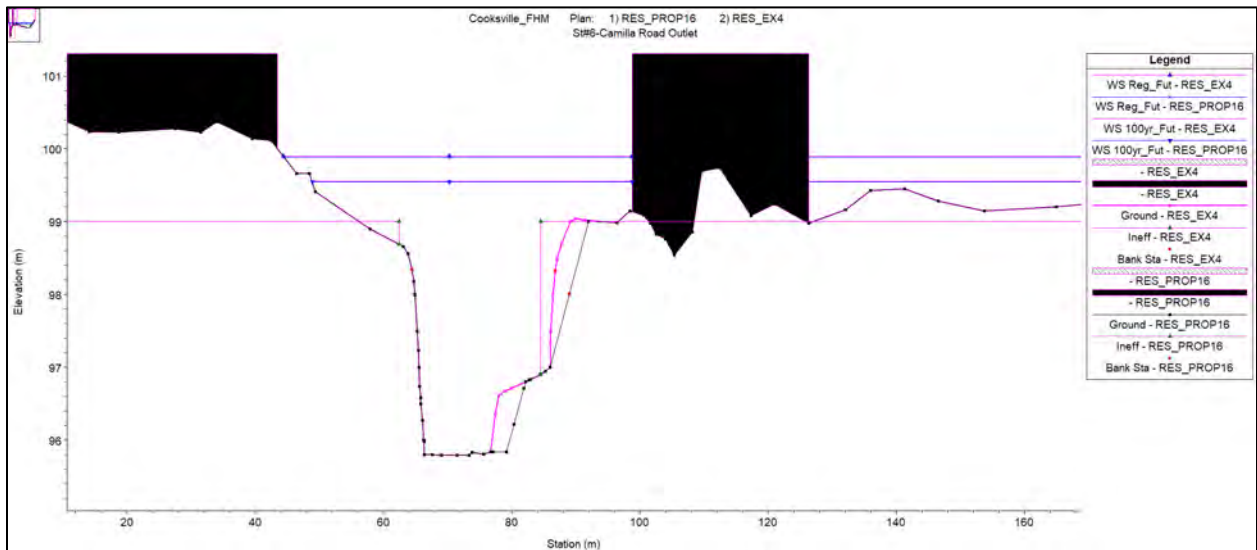


Figure 3. Existing and Proposed Cross Section 13307

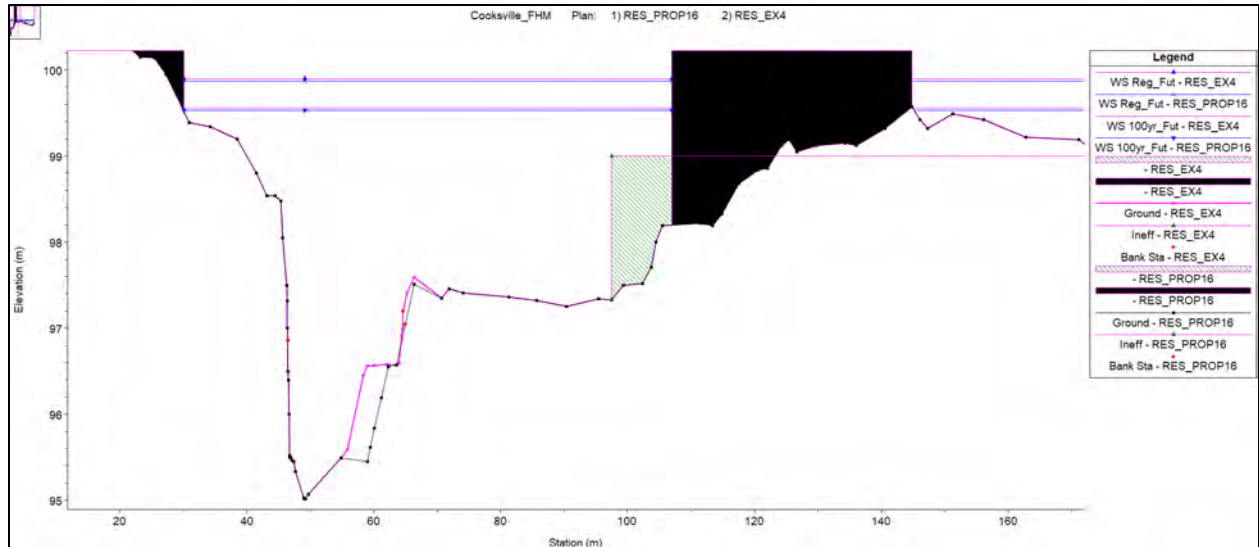


Figure 4. Existing and Proposed Cross Section 13253

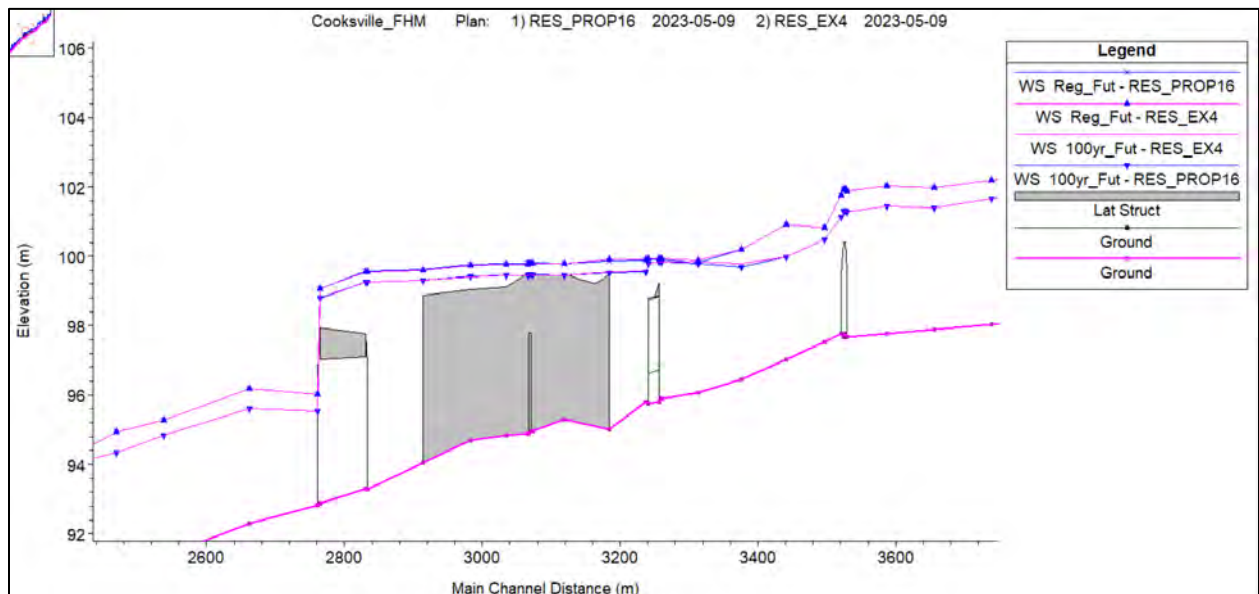


Figure 5. Existing and Proposed Profile View

5 Conclusion

A hydraulic analysis of the existing conditions was provided in support of the detailed design of the preferred alternative for restoration works at the project area. The purpose in completing the analysis was to assess the potential impacts to flood elevations within the creek resulting from the restoration designs. A review of the existing channel in HEC-RAS determined that the channel was satisfactorily modelled and that the proposed design has no significant impacts on the 2-100 year or Regional storm events. No significant changes to water surface elevations or velocities were found.

ATTACHMENT 1
HEC-RAS OUTPUT
(Resilient Existing Scenario)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13598	2yr_Ex	70.40	97.68	99.87	99.35	100.14	0.001689	2.36	39.34	49.05	0.56
Cooksville Creek	2211	13598	5yr_Ex	102.60	97.68	100.36	99.76	100.64	0.001355	2.49	72.71	104.98	0.53
Cooksville Creek	2211	13598	10yr_Ex	134.20	97.68	100.69	100.11	100.97	0.001234	2.60	106.19	126.79	0.51
Cooksville Creek	2211	13598	25yr_Ex	160.60	97.68	100.85	100.45	101.16	0.001323	2.80	125.02	139.67	0.54
Cooksville Creek	2211	13598	50yr_Ex	184.80	97.68	101.11	100.60	101.38	0.001110	2.72	158.60	155.54	0.50
Cooksville Creek	2211	13598	100yr_Ex	211.50	97.68	101.44	100.74	101.66	0.000862	2.57	205.42	176.21	0.45
Cooksville Creek	2211	13598	Reg_Ex	268.20	97.68	101.83	101.01	102.04	0.000775	2.62	269.56	197.89	0.43
Cooksville Creek	2211	13598	2yr_Fut	64.30	97.68	99.78	99.27	100.04	0.001710	2.30	35.68	43.59	0.56
Cooksville Creek	2211	13598	5yr_Fut	96.20	97.68	100.23	99.70	100.53	0.001521	2.54	61.65	90.25	0.55
Cooksville Creek	2211	13598	10yr_Fut	125.50	97.68	100.60	100.04	100.88	0.001263	2.57	96.91	117.90	0.52
Cooksville Creek	2211	13598	25yr_Fut	148.90	97.68	100.78	100.33	101.08	0.001280	2.71	117.06	134.71	0.53
Cooksville Creek	2211	13598	50yr_Fut	171.40	97.68	101.08	100.52	101.32	0.001010	2.58	154.06	153.15	0.48
Cooksville Creek	2211	13598	100yr_Fut	195.00	97.68	101.27	100.62	101.51	0.000950	2.61	180.46	163.11	0.47
Cooksville Creek	2211	13598	Reg_Fut	271.70	97.68	101.88	101.02	102.08	0.000748	2.60	277.95	202.87	0.43
Cooksville Creek	2211	13594	7-Ped Bridge										
Cooksville Creek	2211	13590	2yr_Ex	70.40	97.76	99.64	99.40	100.04	0.003443	2.81	25.96	32.84	0.76
Cooksville Creek	2211	13590	5yr_Ex	102.60	97.76	99.87	99.81	100.47	0.004168	3.44	35.74	56.00	0.86
Cooksville Creek	2211	13590	10yr_Ex	134.20	97.76	100.20	100.20	100.79	0.003466	3.54	58.97	86.92	0.81
Cooksville Creek	2211	13590	25yr_Ex	160.60	97.76	100.67	100.42	101.04	0.001834	2.98	106.23	114.52	0.61
Cooksville Creek	2211	13590	50yr_Ex	184.80	97.76	100.94	100.58	101.27	0.001492	2.88	137.20	134.35	0.56
Cooksville Creek	2211	13590	100yr_Ex	211.50	97.76	101.31	100.71	101.55	0.001051	2.63	187.92	162.07	0.48
Cooksville Creek	2211	13590	Reg_Ex	268.20	97.76	101.69	100.98	101.92	0.000923	2.67	250.73	187.08	0.46
Cooksville Creek	2211	13590	2yr_Fut	64.30	97.76	99.57	99.32	99.94	0.003420	2.71	23.98	21.30	0.75
Cooksville Creek	2211	13590	5yr_Fut	96.20	97.76	99.84	99.73	100.39	0.003984	3.31	33.77	51.84	0.84
Cooksville Creek	2211	13590	10yr_Fut	125.50	97.76	100.14	100.14	100.71	0.003464	3.46	53.90	80.00	0.80
Cooksville Creek	2211	13590	25yr_Fut	148.90	97.76	100.35	100.35	100.91	0.003082	3.51	72.77	98.20	0.77
Cooksville Creek	2211	13590	50yr_Fut	171.40	97.76	100.95	100.50	101.23	0.001260	2.65	138.49	134.97	0.52
Cooksville Creek	2211	13590	100yr_Fut	195.00	97.76	101.13	100.62	101.40	0.001205	2.70	161.46	146.73	0.51
Cooksville Creek	2211	13590	Reg_Fut	271.70	97.76	101.75	100.99	101.96	0.000869	2.62	260.68	189.85	0.45
Cooksville Creek	2211	13565	2yr_Ex	70.40	97.53	99.57	99.45	99.94	0.002770	2.82	39.75	56.53	0.71
Cooksville Creek	2211	13565	5yr_Ex	102.60	97.53	99.84	99.76	100.32	0.003094	3.30	55.35	59.70	0.77
Cooksville Creek	2211	13565	10yr_Ex	134.20	97.53	100.03	100.00	100.63	0.003545	3.77	66.81	61.77	0.84
Cooksville Creek	2211	13565	25yr_Ex	160.60	97.53	100.15	100.12	100.87	0.004036	4.18	74.53	69.14	0.90
Cooksville Creek	2211	13565	50yr_Ex	184.80	97.53	100.41	100.41	101.10	0.003414	4.14	93.88	81.78	0.84
Cooksville Creek	2211	13565	100yr_Ex	211.50	97.53	100.42	100.42	101.31	0.004429	4.73	94.32	82.39	0.96
Cooksville Creek	2211	13565	Reg_Ex	268.20	97.53	100.84	100.84	101.69	0.003668	4.78	133.66	104.39	0.90
Cooksville Creek	2211	13565	2yr_Fut	64.30	97.53	99.49	99.37	99.86	0.002863	2.77	35.19	55.42	0.71
Cooksville Creek	2211	13565	5yr_Fut	96.20	97.53	99.80	99.71	100.25	0.002984	3.20	52.90	59.25	0.75
Cooksville Creek	2211	13565	10yr_Fut	125.50	97.53	99.97	99.93	100.55	0.003471	3.66	63.42	61.16	0.82
Cooksville Creek	2211	13565	25yr_Fut	148.90	97.53	100.10	100.10	100.76	0.003754	3.97	71.56	64.67	0.87
Cooksville Creek	2211	13565	50yr_Fut	171.40	97.53	100.15	100.12	101.00	0.004691	4.50	74.58	69.22	0.97
Cooksville Creek	2211	13565	100yr_Fut	195.00	97.53	100.47	100.47	101.21	0.003533	4.28	98.99	87.15	0.86
Cooksville Creek	2211	13565	Reg_Fut	271.70	97.53	100.82	100.82	101.72	0.003897	4.90	131.47	102.71	0.92
Cooksville Creek	2211	13510	2yr_Ex	70.40	97.03	99.19	99.19	99.73	0.004854	3.31	26.15	42.66	0.90
Cooksville Creek	2211	13510	5yr_Ex	102.60	97.03	99.60	99.60	100.14	0.003622	3.41	49.55	66.71	0.81
Cooksville Creek	2211	13510	10yr_Ex	134.20	97.03	99.88	99.88	100.44	0.003336	3.60	70.40	82.26	0.80
Cooksville Creek	2211	13510	25yr_Ex	160.60	97.03	100.07	100.07	100.65	0.003238	3.76	86.36	89.46	0.80
Cooksville Creek	2211	13510	50yr_Ex	184.80	97.03	99.98	100.20	100.87	0.005156	4.62	78.50	86.19	1.00
Cooksville Creek	2211	13510	100yr_Ex	211.50	97.03	100.08	100.34	101.06	0.005415	4.89	87.96	90.04	1.03
Cooksville Creek	2211	13510	Reg_Ex	268.20	97.03	100.87	100.61	101.34	0.002144	3.75	164.97	112.33	0.68
Cooksville Creek	2211	13510	2yr_Fut	64.30	97.03	99.09	99.09	99.63	0.005249	3.29	22.40	36.06	0.93
Cooksville Creek	2211	13510	5yr_Fut	96.20	97.03	99.54	99.54	100.07	0.003699	3.37	45.45	64.34	0.82
Cooksville Creek	2211	13510	10yr_Fut	125.50	97.03	99.80	99.80	100.36	0.003476	3.58	63.92	78.54	0.81
Cooksville Creek	2211	13510	25yr_Fut	148.90	97.03	99.98	99.98	100.56	0.003322	3.71	78.82	86.34	0.80
Cooksville Creek	2211	13510	50yr_Fut	171.40	97.03	100.13	100.13	100.72	0.003260	3.84	91.89	91.44	0.80
Cooksville Creek	2211	13510	100yr_Fut	195.00	97.03	99.99	100.26	100.96	0.005605	4.83	79.50	86.66	1.04
Cooksville Creek	2211	13510	Reg_Fut	271.70	97.03	100.91	100.61	101.37	0.002079	3.72	168.72	113.86	0.67
Cooksville Creek	2211	13445	2yr_Ex	70.40	96.44	97.85	98.27	99.25	0.007604	5.25	13.41	15.48	1.79
Cooksville Creek	2211	13445	5yr_Ex	102.60	96.44	98.18	98.70	99.75	0.005528	5.55	18.90	17.47	1.61
Cooksville Creek	2211	13445	10yr_Ex	134.20	96.44	99.45	99.13	99.97	0.000748	3.29	62.22	48.44	0.67
Cooksville Creek	2211	13445	25yr_Ex	160.60	96.44	99.64	99.32	100.25	0.000811	3.60	71.66	51.86	0.70
Cooksville Creek	2211	13445	50yr_Ex	184.80	96.44	99.73	99.51	100.46	0.000944	3.97	76.46	57.09	0.76
Cooksville Creek	2211	13445	100yr_Ex	211.50	96.44	99.79	99.70	100.69	0.001152	4.44	79.27	63.35	0.84
Cooksville Creek	2211	13445	Reg_Ex	268.20	96.44	100.17	100.17	101.19	0.001132	4.79	103.36	105.64	0.86
Cooksville Creek	2211	13445	2yr_Fut	64.30	96.44	97.79	98.19	99.14	0.007785	5.15	12.48	14.85	1.79
Cooksville Creek	2211	13445	5yr_Fut	96.20	96.44	98.11	98.61	99.66	0.005947	5.53	17.67	17.05	1.65
Cooksville Creek	2211	13445	10yr_Fut	125.50	96.44	99.34	98.95	99.85	0.000784	3.27	56.74	47.32	0.68
Cooksville Creek	2211	13445	25yr_Fut	148.90	96.44	99.59	99.22	100.14	0.000751	3.42	69.05	51.17	0.67
Cooksville Creek	2211	13445	50yr_Fut	171.40	96.44	99.71	99.41	100.35	0.000845	3.73	74.97	54.35	0.72
Cooksville Creek	2211	13445	100yr_Fut	195.00	96.44	99.78	99.54	100.55	0.000993	4.11	78.72	62.77	0.78
Cooksville Creek	2211	13445	Reg_Fut	271.70	96.44	100.19	100.19	101.22	0.001133	4.81	104.78	105.69	0.86
Cooksville Creek	2211	13382	2yr_Ex	70.30	96.07	98.26	98.05	98.65	0.011769	2.77	26.14	21.76	0.76
Cooksville Creek	2211	13382	5yr_Ex	102.50	96.07	98.96	98.38	99.30	0.006083	2.62	42.97	28.26	0.58
Cooksville Creek	2211	13382	10yr_Ex	134.10	96.07	99.49	98.66	99.82	0.004537	2.63	60.01	60.75	0.52
Cooksville Creek	2211	13382	25yr_Ex	161.00	96.07	99.69	98.92	100.08	0.004926	2.89	67.47	66.62	0.55
Cooksville Creek	2211	13382	50yr_Ex	185.70	96.07	99.79	99.11	100.27	0.005727	3.19	71.35	72.39	0.60
Cooksville Creek	2211	13382	100yr_Ex	212.80	96.07	99.86	99.33	100.45	0.006892	3.55	74.12	74.43	0.66
Cooksville Creek	2211	13382	Reg_Ex	272.90	96.07	99.91	99.75	100.84	0.010703	4.48	76.00	75.78	0.82
Cooksville Creek	2211	13382	2yr_Fut	64.30	96.07	98.15	97.98	98.54	0.013140	2.77	23.74	21.29	0.79
Cooksville Creek	2211	13382	5yr_Fut	96.00	96.07	98.84	98.32	99.18	0.006621	2.62	39.61	26.72	0.60
Cooksville Creek	2211	13382	10yr_Fut	125.80	96.07	99.37	98.57	99.70	0.004762	2.62	55.72	51.79	0.53
Cooksville Creek	2211	13382	25yr_Fut	149.60	96.07	99.63	98.81	99.99	0.004615	2.75	65.26	65.29	0.53
Cooksville Creek	2211	13382	50yr_Fut	172.60	96.07	99.75	99.03	100.18	0.005189	3.01	69.90	71.35	0.57
Cooksville Creek	2211	13382	100yr_Fut	196.70	96.07	99.83	99.20	100.35	0.006103	3.32	72.98	73.59	0

HEC-RAS Plan: RES_EX4 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13382	Reg_Fut	276.40	96.07	99.89	99.76	100.86	0.011191	4.56	75.37	75.33	0.84
Cooksville Creek	2211	13329	2yr_Ex	70.30	95.89	98.25	97.68	98.50	0.000595	2.19	32.16	21.15	0.54
Cooksville Creek	2211	13329	5yr_Ex	102.50	95.89	98.94	98.00	99.20	0.000417	2.26	45.44	23.27	0.47
Cooksville Creek	2211	13329	10yr_Ex	134.10	95.89	99.48	98.28	99.73	0.000335	2.22	66.90	79.65	0.43
Cooksville Creek	2211	13329	25yr_Ex	161.00	95.89	99.69	98.50	99.99	0.000370	2.45	82.49	163.95	0.46
Cooksville Creek	2211	13329	50yr_Ex	185.70	95.89	99.79	98.70	100.15	0.000427	2.69	92.70	173.93	0.49
Cooksville Creek	2211	13329	100yr_Ex	212.80	95.89	99.87	98.90	100.31	0.000505	2.98	100.39	179.22	0.54
Cooksville Creek	2211	13329	Reg_Ex	272.90	95.89	99.94	99.39	100.61	0.000759	3.71	107.20	183.25	0.66
Cooksville Creek	2211	13329	2yr_Fut	64.30	95.89	98.14	97.62	98.38	0.000619	2.14	30.06	21.02	0.54
Cooksville Creek	2211	13329	5yr_Fut	96.00	95.89	98.82	97.94	99.08	0.000435	2.23	43.06	21.93	0.47
Cooksville Creek	2211	13329	10yr_Fut	125.80	95.89	99.34	98.21	99.63	0.000373	2.37	55.28	55.24	0.45
Cooksville Creek	2211	13329	25yr_Fut	149.60	95.89	99.63	98.41	99.90	0.000346	2.33	77.08	143.54	0.44
Cooksville Creek	2211	13329	50yr_Fut	172.60	95.89	99.75	98.60	100.07	0.000389	2.55	88.76	171.19	0.47
Cooksville Creek	2211	13329	100yr_Fut	196.70	95.89	99.84	98.78	100.22	0.000451	2.79	97.13	177.00	0.51
Cooksville Creek	2211	13329	Reg_Fut	276.40	95.89	99.93	99.39	100.62	0.000795	3.78	105.57	182.22	0.68
Cooksville Creek	2211	13317 6-Camilla		Culvert									
Cooksville Creek	2211	13307	2yr_Ex	70.30	95.79	98.03	97.31	98.23	0.002479	2.00	35.21	21.61	0.48
Cooksville Creek	2211	13307	5yr_Ex	102.50	95.79	98.62	97.63	98.86	0.002059	2.18	47.24	133.04	0.45
Cooksville Creek	2211	13307	10yr_Ex	134.10	95.79	99.06	97.92	99.31	0.001847	2.22	63.73	249.27	0.43
Cooksville Creek	2211	13307	25yr_Ex	161.00	95.79	99.33	98.14	99.60	0.001847	2.36	80.35	323.90	0.44
Cooksville Creek	2211	13307	50yr_Ex	185.70	95.79	99.48	98.33	99.78	0.001908	2.48	94.99	370.64	0.45
Cooksville Creek	2211	13307	100yr_Ex	212.80	95.79	99.62	98.53	99.93	0.001969	2.60	109.25	380.97	0.46
Cooksville Creek	2211	13307	Reg_Ex	272.90	95.79	99.90	99.00	100.22	0.002036	2.79	139.13	410.56	0.47
Cooksville Creek	2211	13307	2yr_Fut	64.30	95.79	97.95	97.25	98.14	0.002380	1.91	33.71	21.47	0.46
Cooksville Creek	2211	13307	5yr_Fut	96.00	95.79	98.53	97.57	98.76	0.002083	2.13	45.20	99.87	0.45
Cooksville Creek	2211	13307	10yr_Fut	125.80	95.79	98.96	97.84	99.24	0.001973	2.33	54.67	219.65	0.45
Cooksville Creek	2211	13307	25yr_Fut	149.60	95.79	99.24	98.05	99.51	0.001799	2.29	73.86	297.51	0.43
Cooksville Creek	2211	13307	50yr_Fut	172.60	95.79	99.42	98.23	99.70	0.001819	2.39	89.10	355.40	0.44
Cooksville Creek	2211	13307	100yr_Fut	196.70	95.79	99.56	98.42	99.85	0.001875	2.50	102.83	375.24	0.45
Cooksville Creek	2211	13307	Reg_Fut	276.40	95.79	99.90	99.00	100.23	0.002081	2.82	139.35	410.63	0.48
Cooksville Creek	2211	13253	2yr_Ex	70.30	95.01	97.91	97.01	98.03	0.003651	1.63	55.69	58.43	0.36
Cooksville Creek	2211	13253	5yr_Ex	102.50	95.01	98.59	97.53	98.68	0.002158	1.52	91.05	163.50	0.29
Cooksville Creek	2211	13253	10yr_Ex	134.10	95.01	99.04	97.81	99.14	0.002098	1.65	116.51	234.84	0.30
Cooksville Creek	2211	13253	25yr_Ex	161.00	95.01	99.32	97.97	99.42	0.001964	1.69	141.37	288.49	0.29
Cooksville Creek	2211	13253	50yr_Ex	185.70	95.01	99.48	98.09	99.59	0.002005	1.76	160.13	331.29	0.30
Cooksville Creek	2211	13253	100yr_Ex	212.80	95.01	99.62	98.22	99.74	0.002072	1.84	178.53	333.42	0.30
Cooksville Creek	2211	13253	Reg_Ex	272.90	95.01	99.90	98.48	100.03	0.002173	1.98	214.35	333.42	0.31
Cooksville Creek	2211	13253	2yr_Fut	64.30	95.01	97.83	96.94	97.95	0.003661	1.59	51.52	58.13	0.36
Cooksville Creek	2211	13253	5yr_Fut	96.00	95.01	98.48	97.28	98.58	0.002258	1.51	85.32	128.62	0.30
Cooksville Creek	2211	13253	10yr_Fut	125.80	95.01	98.96	97.75	99.05	0.001866	1.53	111.50	223.59	0.28
Cooksville Creek	2211	13253	25yr_Fut	149.60	95.01	99.23	97.90	99.33	0.001941	1.66	132.73	274.82	0.29
Cooksville Creek	2211	13253	50yr_Fut	172.60	95.01	99.42	98.03	99.52	0.001916	1.70	152.67	319.31	0.29
Cooksville Creek	2211	13253	100yr_Fut	196.70	95.01	99.56	98.15	99.67	0.001971	1.77	170.29	333.32	0.29
Cooksville Creek	2211	13253	Reg_Fut	276.40	95.01	99.90	98.48	100.03	0.002222	2.00	214.61	333.42	0.32
Cooksville Creek	2211	13252 QEW-Spill		Lat Struct									
Cooksville Creek	2211	13189	2yr_Ex	70.30	95.30	97.69	97.01	97.82	0.002114	1.73	51.20	51.17	0.44
Cooksville Creek	2211	13189	5yr_Ex	102.50	95.30	98.48	97.46	98.57	0.000908	1.49	96.33	66.60	0.31
Cooksville Creek	2211	13189	10yr_Ex	134.10	95.30	98.95	97.66	99.03	0.000716	1.49	129.21	192.49	0.28
Cooksville Creek	2211	13189	25yr_Ex	160.85	95.30	99.22	97.80	99.31	0.000692	1.56	151.18	235.33	0.28
Cooksville Creek	2211	13189	50yr_Ex	182.40	95.30	99.38	97.92	99.48	0.000718	1.64	166.18	238.39	0.29
Cooksville Creek	2211	13189	100yr_Ex	203.21	95.30	99.51	98.01	99.62	0.000744	1.72	179.49	239.31	0.30
Cooksville Creek	2211	13189	Reg_Ex	242.21	95.30	99.78	98.08	99.89	0.000752	1.82	206.26	240.07	0.30
Cooksville Creek	2211	13189	2yr_Fut	64.30	95.30	97.61	96.93	97.74	0.002195	1.70	47.04	50.50	0.45
Cooksville Creek	2211	13189	5yr_Fut	96.00	95.30	98.36	97.42	98.46	0.000969	1.49	88.98	64.03	0.32
Cooksville Creek	2211	13189	10yr_Fut	125.80	95.30	98.86	97.61	98.95	0.000720	1.47	123.13	171.98	0.28
Cooksville Creek	2211	13189	25yr_Fut	149.60	95.30	99.14	97.75	99.23	0.000669	1.51	143.85	226.54	0.28
Cooksville Creek	2211	13189	50yr_Fut	171.12	95.30	99.32	97.86	99.42	0.000681	1.58	160.87	237.32	0.28
Cooksville Creek	2211	13189	100yr_Fut	190.32	95.30	99.46	97.96	99.55	0.000703	1.65	173.98	239.17	0.29
Cooksville Creek	2211	13189	Reg_Fut	244.56	95.30	99.78	98.08	99.90	0.000767	1.84	206.23	240.07	0.31
Cooksville Creek	2211	13143	2yr_Ex	70.30	94.95	97.38	96.95	97.66	0.003951	2.47	43.41	60.64	0.59
Cooksville Creek	2211	13143	5yr_Ex	102.50	94.95	98.46	97.47	98.52	0.000733	1.46	148.60	119.35	0.28
Cooksville Creek	2211	13143	10yr_Ex	134.10	94.95	98.94	97.69	98.99	0.000535	1.38	207.64	172.06	0.24
Cooksville Creek	2211	13143	25yr_Ex	160.85	94.95	99.22	97.93	99.27	0.000503	1.41	242.50	186.32	0.24
Cooksville Creek	2211	13143	50yr_Ex	182.40	94.95	99.38	98.03	99.43	0.000520	1.48	262.10	188.03	0.24
Cooksville Creek	2211	13143	100yr_Ex	203.12	94.95	99.51	98.12	99.57	0.000539	1.54	279.18	190.27	0.25
Cooksville Creek	2211	13143	Reg_Ex	240.45	94.95	99.78	98.27	99.85	0.000541	1.61	313.61	193.19	0.25
Cooksville Creek	2211	13143	2yr_Fut	64.30	94.95	97.22	96.85	97.55	0.004822	2.60	34.44	52.50	0.64
Cooksville Creek	2211	13143	5yr_Fut	96.00	94.95	98.34	97.42	98.41	0.000813	1.49	134.60	117.47	0.29
Cooksville Creek	2211	13143	10yr_Fut	125.80	94.95	98.85	97.69	98.91	0.000542	1.37	196.81	165.39	0.24
Cooksville Creek	2211	13143	25yr_Fut	149.60	94.95	99.14	97.88	99.19	0.000489	1.37	232.45	185.49	0.23
Cooksville Creek	2211	13143	50yr_Fut	171.12	94.95	99.32	97.98	99.37	0.000493	1.43	255.22	187.39	0.24
Cooksville Creek	2211	13143	100yr_Fut	190.32	94.95	99.46	98.07	99.51	0.000509	1.48	272.10	188.95	0.24
Cooksville Creek	2211	13143	Reg_Fut	242.67	94.95	99.78	98.27	99.85	0.000551	1.63	313.58	193.19	0.25
Cooksville Creek	2211	13139 5.1-Ped Bridge		Bridge									
Cooksville Creek	2211	13135	2yr_Ex	70.30	94.89	97.06	97.06	97.60	0.009438	3.44	28.38	33.81	0.89
Cooksville Creek	2211	13135	5yr_Ex	102.50	94.89	98.43	97.47	98.49	0.000751	1.40	155.30	124.91	0.27
Cooksville Creek	2211	13135	10yr_Ex	134.10	94.89	98.93	97.74	98.97	0.000511	1.			

River	Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13135	2yr_Fut	64.30	94.89	96.96	96.96	97.51	0.009729	3.41	25.32	30.58	0.89
Cooksville Creek	2211	13135	5yr_Fut	96.00	94.89	98.31	97.45	98.37	0.000854	1.44	140.32	121.91	0.29
Cooksville Creek	2211	13135	10yr_Fut	125.80	94.89	98.84	97.70	98.88	0.000523	1.28	207.62	178.11	0.23
Cooksville Creek	2211	13135	25yr_Fut	149.60	94.89	99.13	97.83	99.17	0.000459	1.28	245.94	190.13	0.22
Cooksville Creek	2211	13135	50yr_Fut	171.12	94.89	99.31	97.97	99.35	0.000458	1.32	270.18	193.84	0.22
Cooksville Creek	2211	13135	100yr_Fut	190.32	94.89	99.44	98.03	99.49	0.000470	1.37	287.92	197.83	0.23
Cooksville Creek	2211	13135	Reg_Fut	242.67	94.89	99.77	98.21	99.82	0.000501	1.50	331.48	198.31	0.24
Cooksville Creek	2211	13104	2yr_Ex	70.30	94.84	97.04	96.73	97.18	0.002928	1.91	52.27	64.01	0.51
Cooksville Creek	2211	13104	5yr_Ex	102.50	94.84	98.43	96.97	98.45	0.000222	0.82	212.78	135.23	0.16
Cooksville Creek	2211	13104	10yr_Ex	134.10	94.84	98.93	97.12	98.94	0.000172	0.81	280.02	153.24	0.14
Cooksville Creek	2211	13104	25yr_Ex	160.74	94.84	99.21	97.25	99.23	0.000168	0.84	319.00	156.53	0.14
Cooksville Creek	2211	13104	50yr_Ex	180.89	94.84	99.36	97.36	99.38	0.000174	0.88	340.76	158.08	0.14
Cooksville Creek	2211	13104	100yr_Ex	198.90	94.84	99.50	97.46	99.52	0.000179	0.91	359.84	159.39	0.15
Cooksville Creek	2211	13104	Reg_Ex	224.98	94.84	99.77	97.58	99.79	0.000168	0.92	398.59	166.40	0.14
Cooksville Creek	2211	13104	2yr_Fut	64.30	94.84	96.91	96.64	97.08	0.003728	2.04	43.91	63.17	0.56
Cooksville Creek	2211	13104	5yr_Fut	96.00	94.84	98.31	96.94	98.33	0.000243	0.84	196.47	134.49	0.16
Cooksville Creek	2211	13104	10yr_Fut	125.80	94.84	98.84	97.08	98.85	0.000172	0.79	267.90	151.71	0.14
Cooksville Creek	2211	13104	25yr_Fut	149.60	94.84	99.13	97.19	99.14	0.000162	0.81	307.84	155.59	0.14
Cooksville Creek	2211	13104	50yr_Fut	170.37	94.84	99.31	97.29	99.33	0.000165	0.85	333.29	157.57	0.14
Cooksville Creek	2211	13104	100yr_Fut	187.43	94.84	99.44	97.39	99.46	0.000169	0.88	352.02	158.84	0.14
Cooksville Creek	2211	13104	Reg_Fut	226.50	94.84	99.77	97.58	99.79	0.000170	0.93	398.53	166.39	0.15
Cooksville Creek	2211	13052	2yr_Ex	70.30	94.70	96.94	96.44	97.05	0.001681	1.72	76.52	74.90	0.40
Cooksville Creek	2211	13052	5yr_Ex	102.50	94.70	98.40	96.68	98.44	0.000292	1.06	196.74	110.27	0.18
Cooksville Creek	2211	13052	10yr_Ex	134.10	94.70	98.90	96.87	98.93	0.000263	1.10	248.11	174.18	0.18
Cooksville Creek	2211	13052	25yr_Ex	160.03	94.70	99.17	96.99	99.21	0.000270	1.17	277.24	186.61	0.18
Cooksville Creek	2211	13052	50yr_Ex	178.22	94.70	99.33	97.07	99.37	0.000283	1.22	293.27	192.13	0.19
Cooksville Creek	2211	13052	100yr_Ex	193.93	94.70	99.46	97.14	99.50	0.000290	1.27	307.30	197.90	0.19
Cooksville Creek	2211	13052	Reg_Ex	214.34	94.70	99.74	97.22	99.78	0.000269	1.27	336.03	208.56	0.19
Cooksville Creek	2211	13052	2yr_Fut	64.30	94.70	96.79	96.39	96.91	0.002108	1.82	64.92	73.89	0.44
Cooksville Creek	2211	13052	5yr_Fut	96.00	94.70	98.28	96.64	98.32	0.000301	1.05	184.96	95.16	0.19
Cooksville Creek	2211	13052	10yr_Fut	125.80	94.70	98.81	96.82	98.84	0.000258	1.07	239.04	168.36	0.18
Cooksville Creek	2211	13052	25yr_Fut	149.50	94.70	99.10	96.94	99.13	0.000258	1.13	269.05	183.59	0.18
Cooksville Creek	2211	13052	50yr_Fut	168.43	94.70	99.28	97.03	99.31	0.000267	1.18	287.92	190.28	0.18
Cooksville Creek	2211	13052	100yr_Fut	183.45	94.70	99.41	97.10	99.45	0.000275	1.22	301.72	195.60	0.19
Cooksville Creek	2211	13052	Reg_Fut	215.63	94.70	99.74	97.22	99.78	0.000273	1.28	335.95	208.53	0.19
Cooksville Creek	2211	12983	2yr_Ex	70.10	94.04	96.78	96.01	96.94	0.001728	1.90	50.03	36.21	0.42
Cooksville Creek	2211	12983	5yr_Ex	102.00	94.04	98.34	96.35	98.41	0.000421	1.35	113.77	56.40	0.23
Cooksville Creek	2211	12983	10yr_Ex	134.00	94.04	98.83	96.63	98.91	0.000424	1.48	148.53	95.11	0.23
Cooksville Creek	2211	12983	25yr_Ex	161.01	94.04	99.09	96.84	99.19	0.000473	1.62	164.41	155.62	0.25
Cooksville Creek	2211	12983	50yr_Ex	179.42	94.04	99.23	96.97	99.34	0.000516	1.73	173.09	167.39	0.26
Cooksville Creek	2211	12983	100yr_Ex	195.47	94.04	99.36	97.08	99.48	0.000548	1.82	180.82	177.86	0.27
Cooksville Creek	2211	12983	Reg_Ex	230.44	94.04	99.60	97.30	99.75	0.000641	2.03	196.61	214.44	0.29
Cooksville Creek	2211	12983	2yr_Fut	64.10	94.04	96.61	95.94	96.78	0.001989	1.93	44.07	34.88	0.44
Cooksville Creek	2211	12983	5yr_Fut	95.40	94.04	98.22	96.28	98.29	0.000418	1.32	108.51	53.51	0.22
Cooksville Creek	2211	12983	10yr_Fut	127.10	94.04	98.74	96.57	98.82	0.000416	1.44	143.52	79.64	0.23
Cooksville Creek	2211	12983	25yr_Fut	152.99	94.04	99.02	96.78	99.11	0.000459	1.58	159.86	124.13	0.24
Cooksville Creek	2211	12983	50yr_Fut	172.49	94.04	99.19	96.92	99.29	0.000497	1.69	170.16	163.36	0.25
Cooksville Creek	2211	12983	100yr_Fut	188.44	94.04	99.31	97.03	99.42	0.000532	1.78	177.68	173.55	0.26
Cooksville Creek	2211	12983	Reg_Fut	231.80	94.04	99.60	97.31	99.75	0.000650	2.05	196.43	214.22	0.29
Cooksville Creek	2211	12903	2yr_Ex	70.10	93.28	96.42	95.16	96.72	0.003347	2.40	29.16	15.12	0.48
Cooksville Creek	2211	12903	5yr_Ex	102.00	93.28	98.28	95.68	98.37	0.000644	1.40	102.91	96.82	0.24
Cooksville Creek	2211	12903	10yr_Ex	134.00	93.28	98.77	96.27	98.86	0.000623	1.51	136.99	183.73	0.24
Cooksville Creek	2211	12903	25yr_Ex	161.01	93.28	99.04	96.59	99.14	0.000659	1.62	157.89	214.59	0.25
Cooksville Creek	2211	12903	50yr_Ex	179.42	93.28	99.18	96.80	99.29	0.000698	1.70	169.09	227.12	0.26
Cooksville Creek	2211	12903	100yr_Ex	195.47	93.28	99.31	96.98	99.43	0.000722	1.76	179.06	237.87	0.26
Cooksville Creek	2211	12903	Reg_Ex	230.44	93.28	99.55	97.36	99.69	0.000779	1.89	198.20	261.19	0.28
Cooksville Creek	2211	12903	2yr_Fut	64.10	93.28	96.27	95.05	96.55	0.003396	2.34	27.42	13.94	0.48
Cooksville Creek	2211	12903	5yr_Fut	95.40	93.28	98.16	95.58	98.25	0.000653	1.38	96.35	79.43	0.24
Cooksville Creek	2211	12903	10yr_Fut	127.10	93.28	98.68	96.19	98.77	0.000621	1.48	130.27	175.64	0.24
Cooksville Creek	2211	12903	25yr_Fut	152.99	93.28	98.96	96.50	99.06	0.000650	1.58	151.92	205.55	0.25
Cooksville Creek	2211	12903	50yr_Fut	172.49	93.28	99.13	96.72	99.24	0.000680	1.67	165.35	223.10	0.25
Cooksville Creek	2211	12903	100yr_Fut	188.44	93.28	99.26	96.90	99.37	0.000709	1.73	175.06	233.55	0.26
Cooksville Creek	2211	12903	Reg_Fut	231.80	93.28	99.55	97.39	99.69	0.000791	1.91	197.93	260.79	0.28
Cooksville Creek	2211	12886 5-QEW	Bridge										
Cooksville Creek	2211	12831	2yr_Ex	70.10	92.83	93.66	94.34	96.35	0.115477	7.27	9.64	14.17	2.81
Cooksville Creek	2211	12831	5yr_Ex	102.00	92.83	94.89	94.71	95.55	0.007767	3.60	28.33	17.99	0.85
Cooksville Creek	2211	12831	10yr_Ex	134.00	92.83	95.13	95.03	96.02	0.008941	4.19	31.99	25.36	0.93
Cooksville Creek	2211	12831	25yr_Ex	161.01	92.83	95.29	95.29	96.40	0.010051	4.67	34.48	32.95	1.00
Cooksville Creek	2211	12831	50yr_Ex	179.42	92.83	95.45	95.45	96.65	0.009843	4.85	37.03	44.05	1.00
Cooksville Creek	2211	12831	100yr_Ex	195.47	92.83	95.60	95.60	96.86	0.009643	4.98	39.22	54.56	1.00
Cooksville Creek	2211	12831	Reg_Ex	230.44	92.83	96.01	95.89	97.31	0.008118	5.06	45.59	71.41	0.94
Cooksville Creek	2211	12831	2yr_Fut	64.10	92.83	93.61	94.27	96.19	0.119409	7.10	9.02	14.13	2.84
Cooksville Creek	2211	12831	5yr_Fut	95.40	92.83	94.84	94.63	95.45	0.007507	3.47	27.49	17.49	0.83
Cooksville Creek	2211	12831	10yr_Fut	127.10	92.83	95.08	94.96	95.92	0.008688	4.07	31.26	23.15	0.91
Cooksville Creek	2211	12831	25yr_Fut	152.99	92.83	95.22	95.22	96.29	0.010140	4.59	33.35	31.59	1.00
Cooksville Creek	2211	12831	50yr_Fut	172.49	92.83	95.40	95.40	96.56	0.009875	4.77	36.13	39.49	1.00
Cooksville Creek	2211	12831	100yr_Fut	188.44	92.83	95.54	95.54	96.77	0.009706	4.92	38.29	50.46	1.00
Cooksville Creek	2211	12831	Reg_Fut	231.80	92.83	96.03	95.90	97.33	0.008002	5.05	45.95	72.11	0.94
Cooksville Creek	2211	12732	2yr_Ex	70.10	92.30	94.24	93.79	94.47	0.003441	2.18	39.81	46.31	0.56
Cooksville Creek	2211	12732	5yr_Ex	102.00	92.30	94.67	94.17	94.91	0.002781	2.30	63.79	65.33	0.52
Cooksville Creek	2211	12732	10yr_Ex	134.00	92.30	95.07	94.43	95.30	0.002247	2.34	92.76	79.30	0.48
Cooksville Creek	2211	12732	25yr_Ex	163.30	92.30	95.30	94.64	95.55	0.002239	2.48	111.48	83.65	0.49
Cooksville Creek	2211	12732	50yr_Ex	190.20	92.30	95.51	94.82	95.77	0.002141	2.56	129.99	88.32	0.49

HEC-RAS Plan: RES_EX4 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	12732	100yr_ Ex	219.90	92.30	95.70	95.00	95.97	0.002153	2.68	147.02	93.05	0.49
Cooksville Creek	2211	12732	Reg_ Ex	299.60	92.30	96.16	95.39	96.47	0.002174	2.96	191.93	104.34	0.51
Cooksville Creek	2211	12732	2yr_ Fut	64.10	92.30	94.15	93.72	94.38	0.003636	2.15	35.64	43.72	0.57
Cooksville Creek	2211	12732	5yr_ Fut	95.40	92.30	94.59	94.08	94.83	0.002886	2.28	58.60	62.87	0.53
Cooksville Creek	2211	12732	10yr_ Fut	127.10	92.30	94.98	94.37	95.22	0.002361	2.34	86.15	77.71	0.49
Cooksville Creek	2211	12732	25yr_ Fut	153.70	92.30	95.22	94.60	95.46	0.002269	2.45	104.88	82.15	0.49
Cooksville Creek	2211	12732	50yr_ Fut	179.30	92.30	95.42	94.75	95.68	0.002190	2.53	122.33	86.29	0.49
Cooksville Creek	2211	12732	100yr_ Fut	206.30	92.30	95.61	94.94	95.88	0.002161	2.63	138.87	90.69	0.49
Cooksville Creek	2211	12732	Reg_ Fut	303.30	92.30	96.18	95.40	96.49	0.002168	2.97	194.32	105.12	0.51
Cooksville Creek	2211	12607	2yr_ Ex	70.10	91.35	93.75	93.33	94.12	0.002159	2.75	35.15	46.59	0.64
Cooksville Creek	2211	12607	5yr_ Ex	102.00	91.35	94.03	93.86	94.55	0.002617	3.32	49.45	56.51	0.72
Cooksville Creek	2211	12607	10yr_ Ex	134.00	91.35	94.17	94.15	94.90	0.003528	4.01	57.51	63.49	0.84
Cooksville Creek	2211	12607	25yr_ Ex	163.30	91.35	94.47	94.47	95.17	0.003092	4.07	77.96	71.23	0.80
Cooksville Creek	2211	12607	50yr_ Ex	190.20	91.35	94.64	94.64	95.40	0.003143	4.28	91.08	83.01	0.82
Cooksville Creek	2211	12607	100yr_ Ex	219.90	91.35	94.90	94.90	95.62	0.002811	4.30	113.09	85.97	0.79
Cooksville Creek	2211	12607	Reg_ Ex	299.60	91.35	95.27	95.27	96.10	0.003007	4.80	144.92	85.97	0.83
Cooksville Creek	2211	12607	2yr_ Fut	64.10	91.35	93.69	93.24	94.03	0.002077	2.63	32.10	44.76	0.62
Cooksville Creek	2211	12607	5yr_ Fut	95.40	91.35	93.98	93.78	94.47	0.002559	3.23	46.28	52.72	0.71
Cooksville Creek	2211	12607	10yr_ Fut	127.10	91.35	94.14	94.14	94.82	0.003340	3.87	55.72	61.78	0.82
Cooksville Creek	2211	12607	25yr_ Fut	153.70	91.35	94.39	94.39	95.09	0.003103	4.00	72.76	69.96	0.80
Cooksville Creek	2211	12607	50yr_ Fut	179.30	91.35	94.58	94.58	95.31	0.003086	4.18	86.15	77.67	0.81
Cooksville Creek	2211	12607	100yr_ Fut	206.30	91.35	94.83	94.83	95.53	0.002754	4.19	107.36	85.97	0.78
Cooksville Creek	2211	12607	Reg_ Fut	303.30	91.35	95.27	95.27	96.12	0.003056	4.84	145.44	85.97	0.84
Cooksville Creek	2211	12538	2yr_ Ex	70.10	91.64	93.68	93.32	93.96	0.001868	2.47	42.45	46.74	0.60
Cooksville Creek	2211	12538	5yr_ Ex	102.00	91.64	93.96	93.67	94.34	0.002170	2.94	56.44	51.16	0.66
Cooksville Creek	2211	12538	10yr_ Ex	134.00	91.64	94.02	93.94	94.63	0.003378	3.73	59.20	51.98	0.83
Cooksville Creek	2211	12538	25yr_ Ex	163.30	91.64	94.08	94.18	94.91	0.004456	4.37	62.51	52.96	0.95
Cooksville Creek	2211	12538	50yr_ Ex	190.20	91.64	94.28	94.38	95.14	0.004222	4.52	73.39	57.19	0.94
Cooksville Creek	2211	12538	100yr_ Ex	219.90	91.64	94.44	94.58	95.37	0.004245	4.74	83.57	63.84	0.96
Cooksville Creek	2211	12538	Reg_ Ex	299.60	91.64	94.92	94.97	95.66	0.003693	4.97	114.68	98.51	0.92
Cooksville Creek	2211	12538	2yr_ Fut	64.10	91.64	93.61	93.22	93.87	0.001838	2.38	39.18	45.65	0.59
Cooksville Creek	2211	12538	5yr_ Fut	95.40	91.64	93.90	93.61	94.27	0.002138	2.86	53.40	50.23	0.65
Cooksville Creek	2211	12538	10yr_ Fut	127.10	91.64	93.98	93.88	94.56	0.003225	3.61	57.59	51.50	0.81
Cooksville Creek	2211	12538	25yr_ Fut	153.70	91.64	94.08	94.08	94.81	0.003920	4.11	62.71	53.02	0.90
Cooksville Creek	2211	12538	50yr_ Fut	179.30	91.64	94.20	94.29	95.05	0.004304	4.46	69.07	55.01	0.95
Cooksville Creek	2211	12538	100yr_ Fut	206.30	91.64	94.34	94.50	95.27	0.004429	4.71	77.25	59.70	0.97
Cooksville Creek	2211	12538	Reg_ Fut	303.30	91.64	94.95	95.00	95.88	0.003663	4.98	116.16	98.89	0.92
Cooksville Creek	2211	12480	2yr_ Ex	70.10	91.42	93.28	93.28	93.78	0.003997	3.29	32.31	47.24	0.86
Cooksville Creek	2211	12480	5yr_ Ex	102.00	91.42	93.61	93.61	94.17	0.003684	3.60	50.28	60.97	0.85
Cooksville Creek	2211	12480	10yr_ Ex	134.00	91.42	93.90	93.90	94.41	0.003108	3.65	74.15	77.10	0.80
Cooksville Creek	2211	12480	25yr_ Ex	163.30	91.42	94.04	94.07	94.62	0.003402	3.98	85.08	80.11	0.85
Cooksville Creek	2211	12480	50yr_ Ex	190.20	91.42	93.97	94.21	94.86	0.005287	4.87	80.09	79.48	1.05
Cooksville Creek	2211	12480	100yr_ Ex	219.90	91.42	94.06	94.35	95.07	0.005879	5.27	86.89	80.34	1.11
Cooksville Creek	2211	12480	Reg_ Ex	299.60	91.42	94.29	94.66	95.55	0.006806	6.05	106.05	87.64	1.22
Cooksville Creek	2211	12480	2yr_ Fut	64.10	91.42	93.21	93.21	93.70	0.004108	3.22	28.90	43.11	0.86
Cooksville Creek	2211	12480	5yr_ Fut	95.40	91.42	93.57	93.57	94.10	0.003527	3.48	47.98	59.75	0.83
Cooksville Creek	2211	12480	10yr_ Fut	127.10	91.42	93.85	93.85	94.36	0.003156	3.61	70.13	75.01	0.80
Cooksville Creek	2211	12480	25yr_ Fut	153.70	91.42	94.02	94.02	94.55	0.003147	3.80	83.47	79.91	0.81
Cooksville Creek	2211	12480	50yr_ Fut	179.30	91.42	93.94	94.15	94.78	0.005048	4.71	77.52	78.69	1.02
Cooksville Creek	2211	12480	100yr_ Fut	206.30	91.42	94.02	94.30	94.98	0.005628	5.09	83.75	79.94	1.09
Cooksville Creek	2211	12480	Reg_ Fut	303.30	91.42	94.30	94.67	95.57	0.006849	6.08	106.85	88.15	1.22

ATTACHMENT 2
HEC-RAS OUTPUT
(Resilient Proposed Scenario)

River	Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13598	2yr_Ex	70.40	97.68	99.87	99.35	100.14	0.001689	2.36	39.34	49.05	0.56
Cooksville Creek	2211	13598	5yr_Ex	102.60	97.68	100.36	99.76	100.64	0.001355	2.49	72.71	104.98	0.53
Cooksville Creek	2211	13598	10yr_Ex	134.20	97.68	100.69	100.11	100.97	0.001234	2.60	106.19	126.79	0.51
Cooksville Creek	2211	13598	25yr_Ex	160.60	97.68	100.85	100.45	101.16	0.001323	2.80	125.02	139.67	0.54
Cooksville Creek	2211	13598	50yr_Ex	184.80	97.68	101.11	100.60	101.38	0.001110	2.72	158.60	155.54	0.50
Cooksville Creek	2211	13598	100yr_Ex	211.50	97.68	101.44	100.74	101.66	0.000862	2.57	205.42	176.21	0.45
Cooksville Creek	2211	13598	Reg_Ex	268.20	97.68	101.83	101.01	102.04	0.000775	2.62	269.56	197.89	0.43
Cooksville Creek	2211	13598	2yr_Fut	64.30	97.68	99.78	99.27	100.04	0.001710	2.30	35.68	43.59	0.56
Cooksville Creek	2211	13598	5yr_Fut	96.20	97.68	100.23	99.70	100.53	0.001521	2.54	61.65	90.25	0.55
Cooksville Creek	2211	13598	10yr_Fut	125.50	97.68	100.60	100.04	100.88	0.001263	2.57	96.91	117.90	0.52
Cooksville Creek	2211	13598	25yr_Fut	148.90	97.68	100.78	100.33	101.08	0.001280	2.71	117.06	134.71	0.53
Cooksville Creek	2211	13598	50yr_Fut	171.40	97.68	101.08	100.52	101.32	0.001010	2.58	154.06	153.15	0.48
Cooksville Creek	2211	13598	100yr_Fut	195.00	97.68	101.27	100.62	101.51	0.000950	2.61	180.46	163.11	0.47
Cooksville Creek	2211	13598	Reg_Fut	271.70	97.68	101.88	101.02	102.08	0.000748	2.60	277.95	202.87	0.43
Cooksville Creek	2211	13594	7-Ped Bridge										
Cooksville Creek	2211	13590	2yr_Ex	70.40	97.76	99.64	99.40	100.04	0.003443	2.81	25.96	32.84	0.76
Cooksville Creek	2211	13590	5yr_Ex	102.60	97.76	99.87	99.81	100.47	0.004168	3.44	35.74	56.00	0.86
Cooksville Creek	2211	13590	10yr_Ex	134.20	97.76	100.20	100.20	100.79	0.003466	3.54	58.97	86.92	0.81
Cooksville Creek	2211	13590	25yr_Ex	160.60	97.76	100.67	100.42	101.04	0.001834	2.98	106.23	114.52	0.61
Cooksville Creek	2211	13590	50yr_Ex	184.80	97.76	100.94	100.58	101.27	0.001492	2.88	137.20	134.35	0.56
Cooksville Creek	2211	13590	100yr_Ex	211.50	97.76	101.31	100.71	101.55	0.001051	2.63	187.92	162.07	0.48
Cooksville Creek	2211	13590	Reg_Ex	268.20	97.76	101.69	100.98	101.92	0.000923	2.67	250.73	187.08	0.46
Cooksville Creek	2211	13590	2yr_Fut	64.30	97.76	99.57	99.32	99.94	0.003420	2.71	23.98	21.30	0.75
Cooksville Creek	2211	13590	5yr_Fut	96.20	97.76	99.84	99.73	100.39	0.003984	3.31	33.77	51.84	0.84
Cooksville Creek	2211	13590	10yr_Fut	125.50	97.76	100.14	100.14	100.71	0.003464	3.46	53.90	80.00	0.80
Cooksville Creek	2211	13590	25yr_Fut	148.90	97.76	100.35	100.35	100.91	0.003082	3.51	72.77	98.20	0.77
Cooksville Creek	2211	13590	50yr_Fut	171.40	97.76	100.95	100.50	101.23	0.001260	2.65	138.49	134.97	0.52
Cooksville Creek	2211	13590	100yr_Fut	195.00	97.76	101.13	100.62	101.40	0.001205	2.70	161.46	146.73	0.51
Cooksville Creek	2211	13590	Reg_Fut	271.70	97.76	101.75	100.99	101.96	0.000869	2.62	260.68	189.85	0.45
Cooksville Creek	2211	13565	2yr_Ex	70.40	97.53	99.57	99.45	99.94	0.002770	2.82	39.75	56.53	0.71
Cooksville Creek	2211	13565	5yr_Ex	102.60	97.53	99.84	99.76	100.32	0.003094	3.30	55.35	59.70	0.77
Cooksville Creek	2211	13565	10yr_Ex	134.20	97.53	100.03	100.00	100.63	0.003545	3.77	66.81	61.77	0.84
Cooksville Creek	2211	13565	25yr_Ex	160.60	97.53	100.15	100.12	100.87	0.004036	4.18	74.53	69.14	0.90
Cooksville Creek	2211	13565	50yr_Ex	184.80	97.53	100.41	100.41	101.10	0.003414	4.14	93.88	81.78	0.84
Cooksville Creek	2211	13565	100yr_Ex	211.50	97.53	100.42	100.42	101.31	0.004429	4.73	94.32	82.39	0.96
Cooksville Creek	2211	13565	Reg_Ex	268.20	97.53	100.84	100.84	101.69	0.003668	4.78	133.66	104.39	0.90
Cooksville Creek	2211	13565	2yr_Fut	64.30	97.53	99.49	99.37	99.86	0.002863	2.77	35.19	55.42	0.71
Cooksville Creek	2211	13565	5yr_Fut	96.20	97.53	99.80	99.71	100.25	0.002984	3.20	52.90	59.25	0.75
Cooksville Creek	2211	13565	10yr_Fut	125.50	97.53	99.97	99.93	100.55	0.003471	3.66	63.42	61.16	0.82
Cooksville Creek	2211	13565	25yr_Fut	148.90	97.53	100.10	100.10	100.76	0.003754	3.97	71.56	64.67	0.87
Cooksville Creek	2211	13565	50yr_Fut	171.40	97.53	100.15	100.12	101.00	0.004691	4.50	74.58	69.22	0.97
Cooksville Creek	2211	13565	100yr_Fut	195.00	97.53	100.47	100.47	101.21	0.003533	4.28	98.99	87.15	0.86
Cooksville Creek	2211	13565	Reg_Fut	271.70	97.53	100.82	100.82	101.72	0.003897	4.90	131.47	102.71	0.92
Cooksville Creek	2211	13510	2yr_Ex	70.40	97.03	99.19	99.19	99.73	0.004854	3.31	26.15	42.66	0.90
Cooksville Creek	2211	13510	5yr_Ex	102.60	97.03	99.60	99.60	100.14	0.003622	3.41	49.55	66.71	0.81
Cooksville Creek	2211	13510	10yr_Ex	134.20	97.03	99.88	99.88	100.44	0.003336	3.60	70.40	82.26	0.80
Cooksville Creek	2211	13510	25yr_Ex	160.60	97.03	100.07	100.07	100.65	0.003238	3.76	86.36	89.46	0.80
Cooksville Creek	2211	13510	50yr_Ex	184.80	97.03	99.98	100.20	100.87	0.005156	4.62	78.50	86.19	1.00
Cooksville Creek	2211	13510	100yr_Ex	211.50	97.03	100.08	100.34	101.06	0.005415	4.89	87.96	90.04	1.03
Cooksville Creek	2211	13510	Reg_Ex	268.20	97.03	100.87	100.61	101.34	0.002144	3.75	164.97	112.33	0.68
Cooksville Creek	2211	13510	2yr_Fut	64.30	97.03	99.09	99.09	99.63	0.005249	3.29	22.40	36.06	0.93
Cooksville Creek	2211	13510	5yr_Fut	96.20	97.03	99.54	99.54	100.07	0.003699	3.37	45.45	64.34	0.82
Cooksville Creek	2211	13510	10yr_Fut	125.50	97.03	99.80	99.80	100.36	0.003476	3.58	63.92	78.54	0.81
Cooksville Creek	2211	13510	25yr_Fut	148.90	97.03	99.98	99.98	100.56	0.003322	3.71	78.82	86.34	0.80
Cooksville Creek	2211	13510	50yr_Fut	171.40	97.03	100.13	100.13	100.72	0.003260	3.84	91.89	91.44	0.80
Cooksville Creek	2211	13510	100yr_Fut	195.00	97.03	99.99	100.26	100.96	0.005605	4.83	79.50	86.66	1.04
Cooksville Creek	2211	13510	Reg_Fut	271.70	97.03	100.91	100.61	101.37	0.002079	3.72	168.72	113.86	0.67
Cooksville Creek	2211	13445	2yr_Ex	70.40	96.44	97.85	98.27	99.25	0.007604	5.25	13.41	15.48	1.79
Cooksville Creek	2211	13445	5yr_Ex	102.60	96.44	98.18	98.70	99.75	0.005528	5.55	18.90	17.47	1.61
Cooksville Creek	2211	13445	10yr_Ex	134.20	96.44	99.39	99.13	99.94	0.000831	3.41	59.00	47.71	0.70
Cooksville Creek	2211	13445	25yr_Ex	160.60	96.44	99.58	99.32	100.22	0.000888	3.71	68.44	50.82	0.73
Cooksville Creek	2211	13445	50yr_Ex	184.80	96.44	99.66	99.51	100.45	0.001043	4.10	72.72	52.20	0.80
Cooksville Creek	2211	13445	100yr_Ex	211.50	96.44	99.34	99.70	100.79	0.002226	5.50	56.73	47.32	1.14
Cooksville Creek	2211	13445	Reg_Ex	268.20	96.44	100.17	100.17	101.19	0.001132	4.79	103.36	105.64	0.86
Cooksville Creek	2211	13445	2yr_Fut	64.30	96.44	97.79	98.19	99.14	0.007785	5.15	12.48	14.85	1.79
Cooksville Creek	2211	13445	5yr_Fut	96.20	96.44	98.11	98.61	99.66	0.005947	5.53	17.67	17.05	1.65
Cooksville Creek	2211	13445	10yr_Fut	125.50	96.44	99.25	98.95	99.82	0.000908	3.43	52.54	46.55	0.72
Cooksville Creek	2211	13445	25yr_Fut	148.90	96.44	99.53	99.22	100.11	0.000819	3.51	66.00	49.38	0.70
Cooksville Creek	2211	13445	50yr_Fut	171.40	96.44	99.64	99.41	100.33	0.000924	3.84	71.67	51.86	0.75
Cooksville Creek	2211	13445	100yr_Fut	195.00	96.44	99.69	99.54	100.54	0.001112	4.27	74.31	53.47	0.83
Cooksville Creek	2211	13445	Reg_Fut	271.70	96.44	100.19	100.19	101.22	0.001133	4.81	104.78	105.69	0.86
Cooksville Creek	2211	13382	2yr_Ex	70.30	96.07	98.20	97.95	98.58	0.003183	2.73	26.47	21.51	0.74
Cooksville Creek	2211	13382	5yr_Ex	102.50	96.07	98.92	98.29	99.26	0.002132	2.59	43.58	27.80	0.57
Cooksville Creek	2211	13382	10yr_Ex	134.10	96.07	99.46	98.57	99.80	0.001808	2.64	60.70	59.55	0.52
Cooksville Creek	2211	13382	25yr_Ex	161.00	96.07	99.66	98.82	100.07	0.002054	2.92	68.10	66.02	0.55
Cooksville Creek	2211	13382	50yr_Ex	185.70	96.07	99.76	99.04	100.27	0.002435	3.23	71.90	71.58	0.60
Cooksville Creek	2211	13382	100yr_Ex	212.80	96.07	99.82	99.25	100.45	0.003011	3.63	74.07	73.20	0.67
Cooksville Creek	2211	13382	Reg_Ex	272.90	96.07	99.83	99.69	100.86	0.004911	4.64	74.38	73.42	0.85
Cooksville Creek	2211	13382	2yr_Fut	64.30	96.07	98.09	97.89	98.47	0.003335	2.73	24.00	21.02	0.77
Cooksville Creek	2211	13382	5yr_Fut	96.00	96.07	98.80	98.23	99.14	0.002234	2.59	40.23	26.24	0.59
Cooksville Creek	2211	13382	10yr_Fut	125.80	96.07	99.33	98.50	99.67	0.001869	2.63	56.08	50.84	0.53
Cooksville Creek	2211	13382	25yr_Fut	149.60	96.07	99.60	98.72	99.98	0.001904	2.78	65.84	64.54	0.53
Cooksville Creek	2211	13382	50yr_Fut	172.60	96.07	99.72	98.92	100.17	0.002196	3.05	70.47	67.43	0.57
Cooksville Creek	2211	13382	100yr_Fut	196.70	96.07	99.80	99.12	100.35	0.002636	3.38	73.19		

HEC-RAS Plan: RES_PROP16 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13382	Reg_Fut	276.40	96.07	99.81	99.71	100.89	0.005107	4.72	73.88	73.05	0.87
Cooksville Creek	2211	13329	2yr_Ex	70.30	95.89	98.20	97.68	98.46	0.000664	2.26	31.10	21.08	0.57
Cooksville Creek	2211	13329	5yr_Ex	102.50	95.89	98.91	98.00	99.18	0.000434	2.29	44.85	22.88	0.48
Cooksville Creek	2211	13329	10yr_Ex	134.10	95.89	99.47	98.28	99.72	0.000341	2.23	66.10	76.52	0.43
Cooksville Creek	2211	13329	25yr_Ex	161.00	95.89	99.68	98.50	99.98	0.000374	2.46	81.68	162.06	0.46
Cooksville Creek	2211	13329	50yr_Ex	185.70	95.89	99.79	98.70	100.15	0.000430	2.70	92.20	173.59	0.49
Cooksville Creek	2211	13329	100yr_Ex	212.80	95.89	99.86	98.90	100.30	0.000513	3.00	99.18	178.40	0.54
Cooksville Creek	2211	13329	Reg_Ex	272.90	95.89	99.92	99.39	100.60	0.000783	3.75	104.84	181.77	0.67
Cooksville Creek	2211	13329	2yr_Fut	64.30	95.89	98.08	97.62	98.33	0.000705	2.23	28.89	20.95	0.58
Cooksville Creek	2211	13329	5yr_Fut	96.00	95.89	98.79	97.94	99.05	0.000456	2.26	42.45	21.79	0.48
Cooksville Creek	2211	13329	10yr_Fut	125.80	95.89	99.32	98.21	99.61	0.000385	2.39	54.37	48.65	0.46
Cooksville Creek	2211	13329	25yr_Fut	149.60	95.89	99.61	98.41	99.89	0.000352	2.35	75.99	137.44	0.44
Cooksville Creek	2211	13329	50yr_Fut	172.60	95.89	99.75	98.60	100.07	0.000393	2.56	88.05	170.68	0.47
Cooksville Creek	2211	13329	100yr_Fut	196.70	95.89	99.83	98.78	100.22	0.000457	2.81	96.06	176.26	0.51
Cooksville Creek	2211	13329	Reg_Fut	276.40	95.89	99.91	99.39	100.62	0.000814	3.81	103.84	181.26	0.68
Cooksville Creek	2211	13317	6-Camilla										
				Culvert									
Cooksville Creek	2211	13307	2yr_Ex	70.30	95.79	97.94	97.17	98.13	0.002792	1.94	36.24	23.81	0.46
Cooksville Creek	2211	13307	5yr_Ex	102.50	95.79	98.58	97.49	98.80	0.002244	2.09	49.09	124.56	0.43
Cooksville Creek	2211	13307	10yr_Ex	134.10	95.79	99.04	97.77	99.25	0.001997	2.01	69.97	246.28	0.39
Cooksville Creek	2211	13307	25yr_Ex	161.00	95.79	99.31	97.99	99.54	0.002009	2.15	86.10	316.70	0.40
Cooksville Creek	2211	13307	50yr_Ex	185.70	95.79	99.47	98.19	99.72	0.002117	2.29	101.01	368.63	0.41
Cooksville Creek	2211	13307	100yr_Ex	212.80	95.79	99.60	98.39	99.88	0.002272	2.43	114.53	379.35	0.43
Cooksville Creek	2211	13307	Reg_Ex	272.90	95.79	99.87	98.83	100.19	0.002540	2.71	142.89	409.54	0.46
Cooksville Creek	2211	13307	2yr_Fut	64.30	95.79	97.86	97.10	98.04	0.002680	1.85	34.72	23.52	0.44
Cooksville Creek	2211	13307	5yr_Fut	96.00	95.79	98.48	97.42	98.69	0.002268	2.04	46.99	92.70	0.43
Cooksville Creek	2211	13307	10yr_Fut	125.80	95.79	98.93	97.70	99.18	0.002160	2.24	56.69	213.46	0.43
Cooksville Creek	2211	13307	25yr_Fut	149.60	95.79	99.23	97.90	99.44	0.001941	2.07	79.79	291.75	0.39
Cooksville Creek	2211	13307	50yr_Fut	172.60	95.79	99.41	98.09	99.64	0.002008	2.20	94.74	349.38	0.40
Cooksville Creek	2211	13307	100yr_Fut	196.70	95.79	99.55	98.27	99.80	0.002118	2.32	108.64	374.42	0.42
Cooksville Creek	2211	13307	Reg_Fut	276.40	95.79	99.88	98.85	100.21	0.002542	2.72	144.73	410.05	0.46
Cooksville Creek	2211	13253	2yr_Ex	70.30	95.01	97.86	96.78	97.97	0.001899	1.58	57.22	58.21	0.34
Cooksville Creek	2211	13253	5yr_Ex	102.50	95.01	98.56	97.13	98.66	0.001229	1.53	93.78	156.11	0.29
Cooksville Creek	2211	13253	10yr_Ex	134.10	95.01	99.01	97.62	99.12	0.001233	1.69	118.95	227.17	0.30
Cooksville Creek	2211	13253	25yr_Ex	161.00	95.01	99.28	97.83	99.41	0.001218	1.77	142.46	282.63	0.30
Cooksville Creek	2211	13253	50yr_Ex	185.70	95.01	99.45	97.98	99.58	0.001275	1.87	161.07	324.15	0.31
Cooksville Creek	2211	13253	100yr_Ex	212.80	95.01	99.59	98.12	99.73	0.001373	1.98	178.27	333.42	0.32
Cooksville Creek	2211	13253	Reg_Ex	272.90	95.01	99.85	98.41	100.02	0.001528	2.19	212.87	333.42	0.34
Cooksville Creek	2211	13253	2yr_Fut	64.30	95.01	97.78	96.70	97.89	0.001859	1.53	53.12	57.92	0.34
Cooksville Creek	2211	13253	5yr_Fut	96.00	95.01	98.45	97.06	98.55	0.001267	1.52	88.07	123.89	0.29
Cooksville Creek	2211	13253	10yr_Fut	125.80	95.01	98.93	97.53	99.03	0.001109	1.58	114.36	218.15	0.28
Cooksville Creek	2211	13253	25yr_Fut	149.60	95.01	99.20	97.74	99.32	0.001181	1.72	134.27	264.76	0.29
Cooksville Creek	2211	13253	50yr_Fut	172.60	95.01	99.38	97.90	99.51	0.001212	1.80	153.35	314.51	0.30
Cooksville Creek	2211	13253	100yr_Fut	196.70	95.01	99.53	98.04	99.66	0.001278	1.90	170.84	333.06	0.31
Cooksville Creek	2211	13253	Reg_Fut	276.40	95.01	99.87	98.43	100.03	0.001532	2.20	215.00	333.42	0.34
Cooksville Creek	2211	13252	QEW-Spill										
				Lat Struct									
Cooksville Creek	2211	13189	2yr_Ex	70.30	95.30	97.69	97.01	97.82	0.002114	1.73	51.20	51.17	0.44
Cooksville Creek	2211	13189	5yr_Ex	102.50	95.30	98.48	97.46	98.57	0.000908	1.49	96.33	66.60	0.31
Cooksville Creek	2211	13189	10yr_Ex	134.10	95.30	98.95	97.66	99.03	0.000716	1.49	129.21	192.49	0.28
Cooksville Creek	2211	13189	25yr_Ex	160.94	95.30	99.22	97.80	99.31	0.000693	1.56	151.19	235.33	0.28
Cooksville Creek	2211	13189	50yr_Ex	183.02	95.30	99.39	97.92	99.48	0.000715	1.64	167.01	238.55	0.29
Cooksville Creek	2211	13189	100yr_Ex	204.15	95.30	99.51	98.02	99.62	0.000747	1.72	179.90	239.32	0.30
Cooksville Creek	2211	13189	Reg_Ex	243.86	95.30	99.78	98.08	99.90	0.000762	1.83	206.26	240.07	0.31
Cooksville Creek	2211	13189	2yr_Fut	64.30	95.30	97.61	96.93	97.74	0.002195	1.70	47.04	50.50	0.45
Cooksville Creek	2211	13189	5yr_Fut	96.00	95.30	98.36	97.42	98.46	0.000969	1.49	88.98	64.03	0.32
Cooksville Creek	2211	13189	10yr_Fut	125.80	95.30	98.86	97.61	98.95	0.000720	1.47	123.13	171.98	0.28
Cooksville Creek	2211	13189	25yr_Fut	149.60	95.30	99.14	97.75	99.23	0.000669	1.51	143.85	226.54	0.28
Cooksville Creek	2211	13189	50yr_Fut	171.49	95.30	99.32	97.86	99.42	0.000683	1.59	160.94	237.33	0.28
Cooksville Creek	2211	13189	100yr_Fut	191.01	95.30	99.46	97.96	99.56	0.000701	1.65	174.70	239.19	0.29
Cooksville Creek	2211	13189	Reg_Fut	246.31	95.30	99.79	98.08	99.91	0.000762	1.84	207.88	240.12	0.31
Cooksville Creek	2211	13143	2yr_Ex	70.30	94.95	97.38	96.95	97.66	0.003951	2.47	43.41	60.64	0.59
Cooksville Creek	2211	13143	5yr_Ex	102.50	94.95	98.46	97.47	98.52	0.000733	1.46	148.60	119.35	0.28
Cooksville Creek	2211	13143	10yr_Ex	134.10	94.95	98.94	97.69	98.99	0.000535	1.38	207.64	172.06	0.24
Cooksville Creek	2211	13143	25yr_Ex	160.94	94.95	99.22	97.94	99.27	0.000504	1.41	242.51	186.32	0.24
Cooksville Creek	2211	13143	50yr_Ex	183.02	94.95	99.39	98.03	99.44	0.000517	1.48	263.16	188.13	0.24
Cooksville Creek	2211	13143	100yr_Ex	204.03	94.95	99.52	98.12	99.58	0.000541	1.54	279.70	190.40	0.25
Cooksville Creek	2211	13143	Reg_Ex	242.08	94.95	99.78	98.27	99.85	0.000548	1.63	313.62	193.19	0.25
Cooksville Creek	2211	13143	2yr_Fut	64.30	94.95	97.22	96.85	97.55	0.004822	2.60	34.44	52.50	0.64
Cooksville Creek	2211	13143	5yr_Fut	96.00	94.95	98.34	97.42	98.41	0.000813	1.49	134.60	117.47	0.29
Cooksville Creek	2211	13143	10yr_Fut	125.80	94.95	98.85	97.69	98.91	0.000542	1.37	196.81	165.39	0.24
Cooksville Creek	2211	13143	25yr_Fut	149.60	94.95	99.14	97.88	99.19	0.000489	1.37	232.45	185.49	0.23
Cooksville Creek	2211	13143	50yr_Fut	171.49	94.95	99.32	97.99	99.38	0.000495	1.43	255.31	187.40	0.24
Cooksville Creek	2211	13143	100yr_Fut	191.00	94.95	99.46	98.07	99.52	0.000508	1.48	273.02	189.04	0.24
Cooksville Creek	2211	13143	Reg_Fut	244.43	94.95	99.80	98.27	99.86	0.000548	1.63	315.71	193.35	0.25
Cooksville Creek	2211	13139	5.1-Ped Bridge										
				Bridge									
Cooksville Creek	2211	13135	2yr_Ex	70.30	94.89	97.06	97.06	97.60	0.009438	3.44	28.38	33.81	0.89
Cooksville Creek	2211	13135											

HEC-RAS Plan: RES_PROP16 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	13135	2yr_Fut	64.30	94.89	96.96	96.96	97.51	0.009729	3.41	25.32	30.58	0.89
Cooksville Creek	2211	13135	5yr_Fut	96.00	94.89	98.31	97.45	98.37	0.000854	1.44	140.32	121.91	0.29
Cooksville Creek	2211	13135	10yr_Fut	125.80	94.89	98.84	97.70	98.88	0.000523	1.28	207.62	178.11	0.23
Cooksville Creek	2211	13135	25yr_Fut	149.60	94.89	99.13	97.83	99.17	0.000459	1.28	245.94	190.13	0.22
Cooksville Creek	2211	13135	50yr_Fut	171.49	94.89	99.31	97.97	99.35	0.000459	1.32	270.28	193.87	0.23
Cooksville Creek	2211	13135	100yr_Fut	191.00	94.89	99.45	98.04	99.50	0.000468	1.37	288.91	197.84	0.23
Cooksville Creek	2211	13135	Reg_Fut	244.43	94.89	99.79	98.22	99.84	0.000498	1.50	333.71	198.34	0.24
Cooksville Creek	2211	13104	2yr_Ex	70.30	94.84	97.04	96.73	97.18	0.002928	1.91	52.27	64.01	0.51
Cooksville Creek	2211	13104	5yr_Ex	102.50	94.84	98.43	96.97	98.45	0.000222	0.82	212.78	135.23	0.16
Cooksville Creek	2211	13104	10yr_Ex	134.10	94.84	98.93	97.12	98.94	0.000172	0.81	280.02	153.24	0.14
Cooksville Creek	2211	13104	25yr_Ex	160.83	94.84	99.21	97.25	99.23	0.000168	0.84	319.01	156.53	0.14
Cooksville Creek	2211	13104	50yr_Ex	181.45	94.84	99.37	97.36	99.39	0.000173	0.88	341.97	158.16	0.14
Cooksville Creek	2211	13104	100yr_Ex	199.56	94.84	99.50	97.48	99.52	0.000179	0.91	360.42	159.43	0.15
Cooksville Creek	2211	13104	Reg_Ex	226.29	94.84	99.77	97.58	99.79	0.000170	0.93	398.58	166.39	0.15
Cooksville Creek	2211	13104	2yr_Fut	64.30	94.84	96.91	96.64	97.08	0.003728	2.04	43.91	63.17	0.56
Cooksville Creek	2211	13104	5yr_Fut	96.00	94.84	98.31	96.94	98.33	0.000243	0.84	196.47	134.49	0.16
Cooksville Creek	2211	13104	10yr_Fut	125.80	94.84	98.84	97.08	98.85	0.000172	0.79	267.90	151.71	0.14
Cooksville Creek	2211	13104	25yr_Fut	149.60	94.84	99.13	97.19	99.14	0.000162	0.81	307.84	155.59	0.14
Cooksville Creek	2211	13104	50yr_Fut	170.70	94.84	99.31	97.29	99.33	0.000166	0.85	333.39	157.58	0.14
Cooksville Creek	2211	13104	100yr_Fut	187.91	94.84	99.45	97.39	99.47	0.000169	0.88	353.07	158.91	0.14
Cooksville Creek	2211	13104	Reg_Fut	228.05	94.84	99.79	97.59	99.81	0.000169	0.93	400.92	166.69	0.15
Cooksville Creek	2211	13052	2yr_Ex	70.30	94.70	96.94	96.44	97.05	0.001681	1.72	76.52	74.90	0.40
Cooksville Creek	2211	13052	5yr_Ex	102.50	94.70	98.40	96.68	98.44	0.000292	1.06	196.74	110.27	0.18
Cooksville Creek	2211	13052	10yr_Ex	134.10	94.70	98.90	96.87	98.93	0.000263	1.10	248.11	174.18	0.18
Cooksville Creek	2211	13052	25yr_Ex	160.10	94.70	99.17	96.99	99.21	0.000270	1.17	277.24	186.61	0.18
Cooksville Creek	2211	13052	50yr_Ex	178.70	94.70	99.34	97.07	99.38	0.000282	1.22	294.18	192.50	0.19
Cooksville Creek	2211	13052	100yr_Ex	194.44	94.70	99.47	97.14	99.51	0.000291	1.27	307.73	198.07	0.19
Cooksville Creek	2211	13052	Reg_Ex	215.35	94.70	99.74	97.22	99.78	0.000272	1.28	336.00	208.55	0.19
Cooksville Creek	2211	13052	2yr_Fut	64.30	94.70	96.79	96.39	96.91	0.002108	1.82	64.92	73.89	0.44
Cooksville Creek	2211	13052	5yr_Fut	96.00	94.70	98.28	96.64	98.32	0.000301	1.05	184.96	95.16	0.19
Cooksville Creek	2211	13052	10yr_Fut	125.80	94.70	98.81	96.82	98.84	0.000258	1.07	239.04	168.36	0.18
Cooksville Creek	2211	13052	25yr_Fut	149.50	94.70	99.10	96.94	99.13	0.000258	1.13	269.05	183.59	0.18
Cooksville Creek	2211	13052	50yr_Fut	168.75	94.70	99.28	97.03	99.31	0.000268	1.18	287.98	190.30	0.18
Cooksville Creek	2211	13052	100yr_Fut	183.91	94.70	99.42	97.10	99.46	0.000274	1.22	302.50	195.92	0.19
Cooksville Creek	2211	13052	Reg_Fut	216.88	94.70	99.75	97.23	99.80	0.000272	1.28	337.70	209.14	0.19
Cooksville Creek	2211	12983	2yr_Ex	70.10	94.04	96.78	96.01	96.94	0.001728	1.90	50.03	36.21	0.42
Cooksville Creek	2211	12983	5yr_Ex	102.00	94.04	98.34	96.35	98.41	0.000421	1.35	113.77	56.40	0.23
Cooksville Creek	2211	12983	10yr_Ex	134.00	94.04	98.83	96.63	98.91	0.000424	1.48	148.53	95.11	0.23
Cooksville Creek	2211	12983	25yr_Ex	161.04	94.04	99.09	96.84	99.19	0.000473	1.62	164.42	155.62	0.25
Cooksville Creek	2211	12983	50yr_Ex	179.81	94.04	99.24	96.97	99.35	0.000514	1.73	173.63	168.14	0.26
Cooksville Creek	2211	12983	100yr_Ex	195.84	94.04	99.36	97.08	99.48	0.000548	1.82	181.07	178.27	0.27
Cooksville Creek	2211	12983	Reg_Ex	231.16	94.04	99.60	97.31	99.75	0.000646	2.04	196.53	214.34	0.29
Cooksville Creek	2211	12983	2yr_Fut	64.10	94.04	96.61	95.94	96.78	0.001989	1.93	44.07	34.88	0.44
Cooksville Creek	2211	12983	5yr_Fut	95.40	94.04	98.22	96.28	98.29	0.000418	1.32	108.51	53.51	0.22
Cooksville Creek	2211	12983	10yr_Fut	127.10	94.04	98.74	96.57	98.82	0.000416	1.44	143.52	79.64	0.23
Cooksville Creek	2211	12983	25yr_Fut	152.99	94.04	99.02	96.78	99.11	0.000459	1.58	159.86	124.13	0.24
Cooksville Creek	2211	12983	50yr_Fut	172.85	94.04	99.19	96.92	99.29	0.000499	1.69	170.17	163.39	0.25
Cooksville Creek	2211	12983	100yr_Fut	188.94	94.04	99.32	97.04	99.43	0.000532	1.78	178.14	174.16	0.26
Cooksville Creek	2211	12983	Reg_Fut	232.70	94.04	99.62	97.32	99.76	0.000648	2.05	197.61	215.62	0.29
Cooksville Creek	2211	12903	2yr_Ex	70.10	93.28	96.42	95.16	96.72	0.003347	2.40	29.16	15.12	0.48
Cooksville Creek	2211	12903	5yr_Ex	102.00	93.28	98.28	95.68	98.37	0.000644	1.40	102.91	96.82	0.24
Cooksville Creek	2211	12903	10yr_Ex	134.00	93.28	98.77	96.27	98.86	0.000623	1.51	136.99	183.73	0.24
Cooksville Creek	2211	12903	25yr_Ex	161.04	93.28	99.04	96.59	99.14	0.000660	1.62	157.89	214.59	0.25
Cooksville Creek	2211	12903	50yr_Ex	179.81	93.28	99.19	96.80	99.30	0.000694	1.70	169.83	227.92	0.26
Cooksville Creek	2211	12903	100yr_Ex	195.84	93.28	99.31	96.98	99.43	0.000721	1.76	179.40	238.23	0.26
Cooksville Creek	2211	12903	Reg_Ex	231.16	93.28	99.55	97.37	99.69	0.000785	1.90	198.08	261.01	0.28
Cooksville Creek	2211	12903	2yr_Fut	64.10	93.28	96.27	95.05	96.55	0.003396	2.34	27.42	13.94	0.48
Cooksville Creek	2211	12903	5yr_Fut	95.40	93.28	98.16	95.58	98.25	0.000653	1.38	96.35	79.43	0.24
Cooksville Creek	2211	12903	10yr_Fut	127.10	93.28	98.68	96.19	98.77	0.000621	1.48	130.27	175.64	0.24
Cooksville Creek	2211	12903	25yr_Fut	152.99	93.28	98.96	96.50	99.06	0.000650	1.58	151.92	205.55	0.25
Cooksville Creek	2211	12903	50yr_Fut	172.85	93.28	99.13	96.73	99.24	0.000683	1.67	165.35	223.10	0.25
Cooksville Creek	2211	12903	100yr_Fut	188.94	93.28	99.26	96.90	99.38	0.000706	1.73	175.67	234.22	0.26
Cooksville Creek	2211	12903	Reg_Fut	232.70	93.28	99.57	97.39	99.70	0.000783	1.90	199.32	262.86	0.28
Cooksville Creek	2211	12886 5-QEW	Bridge										
Cooksville Creek	2211	12831	2yr_Ex	70.10	92.83	93.66	94.34	96.35	0.115477	7.27	9.64	14.17	2.81
Cooksville Creek	2211	12831	5yr_Ex	102.00	92.83	94.89	94.71	95.55	0.007767	3.60	28.33	17.99	0.85
Cooksville Creek	2211	12831	10yr_Ex	134.00	92.83	95.13	95.03	96.02	0.008941	4.19	31.99	25.36	0.93
Cooksville Creek	2211	12831	25yr_Ex	161.04	92.83	95.29	95.29	96.40	0.010020	4.67	34.52	32.98	1.00
Cooksville Creek	2211	12831	50yr_Ex	179.81	92.83	95.46	95.46	96.66	0.009802	4.84	37.12	44.53	1.00
Cooksville Creek	2211	12831	100yr_Ex	195.84	92.83	95.60	95.60	96.87	0.009614	4.98	39.30	54.88	1.00
Cooksville Creek	2211	12831	Reg_Ex	231.16	92.83	96.00	95.90	97.32	0.008200	5.08	45.53	71.30	0.95
Cooksville Creek	2211	12831	2yr_Fut	64.10	92.83	93.61	94.27	96.19	0.119409	7.10	9.02	14.13	2.84
Cooksville Creek	2211	12831	5yr_Fut	95.40	92.83	94.84	94.63	95.45	0.007507	3.47	27.49	17.49	0.83
Cooksville Creek	2211	12831	10yr_Fut	127.10	92.83	95.08	94.96	95.92	0.008688	4.07	31.26	23.15	0.91
Cooksville Creek	2211	12831	25yr_Fut	152.99	92.83	95.22	95.22	96.29	0.010140	4.59	33.35	31.59	1.00
Cooksville Creek	2211	12831	50yr_Fut	172.85	92.83	95.40	95.40	96.56	0.009853	4.78	36.20	39.84	1.00
Cooksville Creek	2211	12831	100yr_Fut	188.94	92.83	95.54	95.54	96.78	0.009704	4.93	38.36	50.78	1.00
Cooksville Creek	2211	12831	Reg_Fut	232.70	92.83	96.02	95.91	97.34	0.008117	5.07	45.86	71.93	0.94
Cooksville Creek	2211	12732	2yr_Ex	70.10	92.30	94.24	93.79	94.47	0.003441	2.18	39.81	46.31	0.56
Cooksville Creek	2211	12732	5yr_Ex	102.00	92.30	94.67	94.17	94.91	0.002781	2.30	63.79	65.33	0.52
Cooksville Creek	2211	12732	10yr_Ex	134.00	92.30	95.07	94.43	95.30	0.002247	2.34	92.76	79.30	0.48
Cooksville Creek	2211	12732	25yr_Ex	163.30	92.30	95.30	94.64	95.55	0.002239	2.48	111.48	83.65	0.49
Cooksville Creek	2211	12732	50yr_Ex	190.20	92.30	95.51	94.82	95.77	0.002141	2.56	129.99	88.32	0.49

HEC-RAS Plan: RES_PROP16 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Cooksville Creek	2211	12732	100yr_ Ex	219.90	92.30	95.70	95.00	95.97	0.002153	2.68	147.02	93.05	0.49
Cooksville Creek	2211	12732	Reg_ Ex	299.60	92.30	96.16	95.39	96.47	0.002170	2.96	192.09	104.39	0.51
Cooksville Creek	2211	12732	2yr_ Fut	64.10	92.30	94.15	93.72	94.38	0.003636	2.15	35.64	43.72	0.57
Cooksville Creek	2211	12732	5yr_ Fut	95.40	92.30	94.59	94.08	94.83	0.002886	2.28	58.60	62.87	0.53
Cooksville Creek	2211	12732	10yr_ Fut	127.10	92.30	94.98	94.37	95.22	0.002361	2.34	86.15	77.71	0.49
Cooksville Creek	2211	12732	25yr_ Fut	153.70	92.30	95.22	94.60	95.46	0.002269	2.45	104.88	82.15	0.49
Cooksville Creek	2211	12732	50yr_ Fut	179.30	92.30	95.42	94.75	95.68	0.002183	2.53	122.49	86.34	0.49
Cooksville Creek	2211	12732	100yr_ Fut	206.30	92.30	95.61	94.94	95.88	0.002161	2.63	138.87	90.69	0.49
Cooksville Creek	2211	12732	Reg_ Fut	303.30	92.30	96.18	95.40	96.49	0.002168	2.97	194.32	105.12	0.51
Cooksville Creek	2211	12607	2yr_ Ex	70.10	91.35	93.75	93.33	94.12	0.002159	2.75	35.15	46.59	0.64
Cooksville Creek	2211	12607	5yr_ Ex	102.00	91.35	94.03	93.86	94.55	0.002617	3.32	49.45	56.51	0.72
Cooksville Creek	2211	12607	10yr_ Ex	134.00	91.35	94.17	94.15	94.90	0.003528	4.01	57.51	63.49	0.84
Cooksville Creek	2211	12607	25yr_ Ex	163.30	91.35	94.47	94.47	95.17	0.003092	4.07	77.96	71.23	0.80
Cooksville Creek	2211	12607	50yr_ Ex	190.20	91.35	94.64	94.64	95.40	0.003143	4.28	91.08	83.01	0.82
Cooksville Creek	2211	12607	100yr_ Ex	219.90	91.35	94.90	94.90	95.62	0.002811	4.30	113.09	85.97	0.79
Cooksville Creek	2211	12607	Reg_ Ex	299.60	91.35	95.26	95.26	96.10	0.003026	4.81	144.53	85.97	0.83
Cooksville Creek	2211	12607	2yr_ Fut	64.10	91.35	93.69	93.24	94.03	0.002077	2.63	32.10	44.76	0.62
Cooksville Creek	2211	12607	5yr_ Fut	95.40	91.35	93.98	93.78	94.47	0.002559	3.23	46.28	52.72	0.71
Cooksville Creek	2211	12607	10yr_ Fut	127.10	91.35	94.14	94.14	94.82	0.003340	3.87	55.72	61.78	0.82
Cooksville Creek	2211	12607	25yr_ Fut	153.70	91.35	94.39	94.39	95.09	0.003103	4.00	72.76	69.96	0.80
Cooksville Creek	2211	12607	50yr_ Fut	179.30	91.35	94.57	94.57	95.31	0.003112	4.20	85.75	77.25	0.81
Cooksville Creek	2211	12607	100yr_ Fut	206.30	91.35	94.83	94.83	95.53	0.002754	4.19	107.36	85.97	0.78
Cooksville Creek	2211	12607	Reg_ Fut	303.30	91.35	95.27	95.27	96.12	0.003056	4.84	145.44	85.97	0.84
Cooksville Creek	2211	12538	2yr_ Ex	70.10	91.64	93.68	93.32	93.96	0.001868	2.47	42.45	46.74	0.60
Cooksville Creek	2211	12538	5yr_ Ex	102.00	91.64	93.96	93.67	94.34	0.002170	2.94	56.44	51.16	0.66
Cooksville Creek	2211	12538	10yr_ Ex	134.00	91.64	94.02	93.94	94.63	0.003378	3.73	59.20	51.98	0.83
Cooksville Creek	2211	12538	25yr_ Ex	163.30	91.64	94.08	94.18	94.91	0.004456	4.37	62.51	52.96	0.95
Cooksville Creek	2211	12538	50yr_ Ex	190.20	91.64	94.28	94.38	95.14	0.004222	4.52	73.39	57.19	0.94
Cooksville Creek	2211	12538	100yr_ Ex	219.90	91.64	94.44	94.58	95.37	0.004245	4.74	83.57	63.84	0.96
Cooksville Creek	2211	12538	Reg_ Ex	299.60	91.64	94.92	94.97	95.66	0.003689	4.97	114.74	98.52	0.92
Cooksville Creek	2211	12538	2yr_ Fut	64.10	91.64	93.61	93.22	93.87	0.001838	2.38	39.18	45.65	0.59
Cooksville Creek	2211	12538	5yr_ Fut	95.40	91.64	93.90	93.61	94.27	0.002138	2.86	53.40	50.23	0.65
Cooksville Creek	2211	12538	10yr_ Fut	127.10	91.64	93.98	93.88	94.56	0.003225	3.61	57.59	51.50	0.81
Cooksville Creek	2211	12538	25yr_ Fut	153.70	91.64	94.08	94.08	94.81	0.003920	4.11	62.71	53.02	0.90
Cooksville Creek	2211	12538	50yr_ Fut	179.30	91.64	94.20	94.29	95.05	0.004295	4.46	69.14	55.03	0.95
Cooksville Creek	2211	12538	100yr_ Fut	206.30	91.64	94.34	94.50	95.27	0.004429	4.71	77.25	59.70	0.97
Cooksville Creek	2211	12538	Reg_ Fut	303.30	91.64	94.95	95.00	95.88	0.003663	4.98	116.16	98.89	0.92
Cooksville Creek	2211	12480	2yr_ Ex	70.10	91.42	93.28	93.28	93.78	0.003997	3.29	32.31	47.24	0.86
Cooksville Creek	2211	12480	5yr_ Ex	102.00	91.42	93.61	93.61	94.17	0.003684	3.60	50.28	60.97	0.85
Cooksville Creek	2211	12480	10yr_ Ex	134.00	91.42	93.90	93.90	94.41	0.003108	3.65	74.15	77.10	0.80
Cooksville Creek	2211	12480	25yr_ Ex	163.30	91.42	94.04	94.07	94.62	0.003402	3.98	85.08	80.11	0.85
Cooksville Creek	2211	12480	50yr_ Ex	190.20	91.42	93.97	94.21	94.86	0.005287	4.87	80.09	79.48	1.05
Cooksville Creek	2211	12480	100yr_ Ex	219.90	91.42	94.06	94.35	95.07	0.005879	5.27	86.89	80.34	1.11
Cooksville Creek	2211	12480	Reg_ Ex	299.60	91.42	94.29	94.66	95.55	0.006806	6.05	106.04	87.64	1.22
Cooksville Creek	2211	12480	2yr_ Fut	64.10	91.42	93.21	93.21	93.70	0.004108	3.22	28.90	43.11	0.86
Cooksville Creek	2211	12480	5yr_ Fut	95.40	91.42	93.57	93.57	94.10	0.003527	3.48	47.98	59.75	0.83
Cooksville Creek	2211	12480	10yr_ Fut	127.10	91.42	93.85	93.85	94.36	0.003156	3.61	70.13	75.01	0.80
Cooksville Creek	2211	12480	25yr_ Fut	153.70	91.42	94.02	94.02	94.55	0.003147	3.80	83.47	79.91	0.81
Cooksville Creek	2211	12480	50yr_ Fut	179.30	91.42	93.95	94.15	94.78	0.004996	4.69	77.89	78.85	1.02
Cooksville Creek	2211	12480	100yr_ Fut	206.30	91.42	94.02	94.30	94.98	0.005628	5.09	83.75	79.94	1.09
Cooksville Creek	2211	12480	Reg_ Fut	303.30	91.42	94.30	94.67	95.57	0.006849	6.08	106.85	88.15	1.22

Appendix B

CVC Standard Parameters

HYMO Models

Rainfall Single Event Return Periods

- Pattern - Keifer & Chu (Chicago)
- Duration - 24 hours, 5 or 10 min time step
- IDF Curves - Municipality or the following CVC values

Rainfall Intensity Duration Frequency Values - **Below** The Escarpment

Duration <u>min</u>	2 year <u>mm / hr</u>	5 year <u>mm / hr</u>	10 year <u>mm / hr</u>	25 year <u>mm / hr</u>	50 year <u>mm / hr</u>	100 year <u>mm / hr</u>
5	102	135	155	180	200	220
10	80	100	115	135	145	160
15	64	85	99	117	130	140
30	41	56	65	77	86	94
60	24	33	39	46	52	57
120	14	19	23	27	31	34
360	6.3	8.2	9.5	11	12	14
720	4.0	5.0	5.7	6.6	7.2	7.8
1440	2.1	2.6	3.0	3.5	3.9	4.3

Rainfall Intensity Duration Frequency Values - **Above** The Escarpment

Duration <u>min</u>	2 year <u>mm / hr</u>	5 year <u>mm / hr</u>	10 year <u>mm / hr</u>	25 year <u>mm / hr</u>	50 year <u>mm / hr</u>	100 year <u>mm / hr</u>
5	102	135	155	180	200	220
10	80	100	115	135	145	160
15	64	85	99	117	130	140
30	41	58	70	85	96	107
60	24	34	40	49	55	61
120	16	21	24	29	32	35
360	6.3	8.3	9.7	11	13	14
720	3.9	5.1	5.9	6.9	7.6	8.3
1440	2.4	3.1	3.6	4.2	4.7	5.1

Curve Numbers

<u>Cover</u>	<u>Hydrologic Soil Group</u>			
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Woods	36	60	73	79
Meadows	46	66	77	82
Cultivated	66	74	82	86
Lawns	56	71	81	85
Impervious areas	100	100	100	100

Initial Abstraction / Depression Storage

<u>Cover</u>	<u>Depth, mm</u>
Woods	10
Meadows	8
Cultivated	4
Lawns	5
Impervious areas	2

Manning Roughness Coefficients - Overland Flow

<u>Cover</u>	<u>n</u>
Woods	0.400
Meadows	0.350
Cultivated	0.300
Lawns	0.250
Impervious areas	0.013

Infiltration Parameters

<u>Soil Group</u>	<u>Minimum Infiltration Rate mm / hr</u>	<u>Maximum Infiltration Rate mm / hr</u>
A	25	250
B	13	200
C	5	125
D	3	75
Decay Parameter	2 hr ⁻¹	

HEC-RAS / HEC-2 Models

Manning Roughness Coefficients

<u>Overbank</u>	Woods	0.080
	Meadows	0.055
	Lawns	0.045
<u>Channel</u>	Natural	0.035
	Grass	0.030
	Natural Rock	0.030
	Armour Stone	0.025
	Concrete	0.013
	Articulated Block i.e. Terrafix	0.020
	Gabions	0.025
	Wood	0.015
	Corrugated Steel Pipe - 3"x1"	0.024
	Structural Plate Corrugated Steel Pipe - 6"x2"	0.032

Expansion and Contraction Coefficients

Natural sections	0.1 contraction 0.3 expansion
Abrupt changes (e.g. road / rail crossings)	0.3 contraction 0.5 expansion

Weir Coefficient

Weir Coefficient	1.5
------------------	-----

Starting Water Surface Elevations - Lake Ontario at Mississauga

Return Period <u>Years</u>	Flood Elevation <u>Metres</u>
100	76.0
50	75.9
25	75.8
10	75.7
5	75.6
2	75.4
Mean annual	74.8

Values for Lake Ontario at Toronto includes +0.08 m conversion from Great Lakes Datum to Geodetic Datum 100 year Lake Ontario Level at Mississauga is 75.91.

HEC-RAS Options

Output Options

Critical Always Calculated No

Conveyance Calculations

At breaks in Manning N values Yes

Between every coordinate point No

Friction Slope Methods

Average conveyance No

Average Friction Slope No

Geometric Mean Friction Slope No

Harmonic Mean Friction Slope No

Program Selects Appropriate Method Yes

Calculation Tolerances

Water Surface 0.003

Critical Depth 0.003

Maximum Iterations 40

Maximum Difference Tolerance 0.1

Flow Tolerance Factor 0.001

Critical Depth

Multiple Critical Depth Search Yes

Parabolic Method No

Cross Sections

Maximum Points on Cross Section 500

Bridges Coding Procedure

Culvert No

Bridge Yes

Momentum Equation

- Add Friction Component Yes

- Add Weight Component Yes

Momentum Class B Defaults

- Inside U/S End Yes

- Inside D/S End No

HEC - RAS Options continuedPressure Flow Criteria

- | | |
|-------------------------------|-----|
| - U/S Energy Grade Line | Yes |
| - U/S Water Surface Elevation | No |

Bridges / Culverts - Deck / Roadway

- | | |
|----------------------------------|-----|
| - Maximum Allowance | 95% |
| - Submergence Broad Crested Weir | Yes |
| - Submergence Ogee Crested Weir | No |

Low Flow

- | | |
|----------------------------|-----|
| - Energy (Standard Step) | Yes |
| - Momentum | Yes |
| - Yarnell | Yes |
| - Highest Energy Answer | Yes |

High Flow Methods

- | | |
|---------------------------------|-------|
| - Energy Only (Standard Step) | |
| - Pressure and / or Weir | |
| Submerged Inlet Cd | Blank |
| Submerged Inlet and Outlet | 0.8 |
| Maximum Low Chord | Blank |

Flow Regime

- | | |
|---------------|-----|
| Subcritical | No |
| Supercritical | No |
| Mixed | Yes |

APPENDIX D

Communications

Project Contact List

**City of Mississauga Municipal Class EA Study: Cooksville Creek Erosion Control Project at Camilla Road
Stakeholder Mailing List - Notice of Study Completion**

Last Update: October 26, 2023

Removed from mailing list for Notice of Study Completion

Organization	Position	Name	Email	Address	City	Province	Postal Code	Phone
Proponent(s)								
City of Mississauga	Storm Drainage Engineer	Anthony Di Giandomenico	anthony.digiandomenico@mississauga.ca	201 City Centre Dr, Suite 800	Mississauga	ON	L5B 2T4	905-615-3200 ext.3491
City of Mississauga	*Ward 7 Councillor	Dipika Damerla	dipika.damerla@mississauga.ca					
Federal/Provincial Agencies								
Fisheries and Oceans Canada	Fish and Fish Habitat Protection Program		FisheriesProtection@dfo-mpo.gc.ca	867 Lakeshore Road	Burlington	ON	L7S 1A1	1-855-852-8320
Fisheries and Oceans Canada	Manager, Office of Environmental Coordination	Heather Ferguson	heather.ferguson@dfo-mpo.gc.ca	867 Lakeshore Road	Burlington	ON	L7S 1A1	
Fisheries and Oceans Canada	Area Manager, Client Services	Mark Sandeman	mark.sandeman@dfo-mpo.gc.ca	867 Lakeshore Road	Burlington	ON	L7S 1A1	
Transport Canada	Environmental Coordinator		EnviroOnt@tc.gc.ca	4900 Yonge St.	North York	ON	M2N 6A5	
Transport Canada Marine Office, Navigable Waters Protection Program	Regional Manager		NPPONT-PPNONT@tc.gc.ca	100 S Front Street, 1st Floor	Sarnia	ON	N7T 2M4	519-383-1863
Crown-Indigenous Relations and Northern Affairs Canada			indigenous.consultations.autochtones@canada.ca					
Ministry of Indigenous Affairs	Manager, Correspondence Unit	David Fraser	david.fraser@ontario.ca	160 Bloor Street East, 9th Floor	Toronto	ON	M7A 2E6	
Toronto Indigenous Services Canada			aadnc.infopubs.aandc@canada.ca	655 Bay Street 3rd Floor	Toronto	ON	M5G 2K4	416-973-5282
Ministry of the Environment, Conservation and Parks (MECP)	Environmental Resource Planner & EA Coordinator	Trevor Bell	trevor.bell@ontario.ca; eanotification.region@ontario.ca	8th, 135 St Clair Ave W	Toronto	ON	M4V 1P5	905-319-9902
Ministry of Natural Resources and Forestry	District Manager, Southern Region Aurora District	Brad Allan	brad.allan@ontario.ca	50 Bloomington Road	Aurora	ON	L4G 0L8	905-713-7400
Ministry of Municipal Affairs and Housing	EA Coordinator		mininfo.mah@ontario.ca	College Park, 777 Bay Street, 17th Floor	Toronto	ON	M5G 2E5	
Ministry of Citizenship and Multiculturalism (formerly MHSTCI)	Team Lead - Heritage	Karla Barboza	General_info@mtc.gov.on.ca	401 Bay Street, Suite 1700	Toronto	ON	M7A 0A7	416-314-7265
Ministry of Citizenship and Multiculturalism (formerly MHSTCI)	Heritage Planner	Laura Hatcher	laura.e.hatcher@ontario.ca	401 Bay Street, Suite 1700	Toronto	ON	M7A 0A7	
Ministry of Agriculture, Food and Rural Affairs		Jocelyn Beatty	jocelyn.beatty@ontario.ca	Ontario Government Building, 3rd Floor, 1 Stone Rd. W.	Guelph	ON	N1G 4Y2	
Ministry of Transportation	Director, Provincial and Environmental Planning Office	Linda McAusland	linda.mcausland@ontario.ca					
Ministry of Public Infrastructure	Manager, Planning and Analysis	Tija Dirks	tija.dirks@ontario.ca	777 Bay Street, 16th Floor	Toronto	ON	M5G 2E5	
Ministry of Infrastructure Ontario	Environmental Advisor	Lisa Myslicki	lisa.myslicki@infrastructureontario.ca	1 Dundas St. W., Suite 2000	Toronto	ON	M5G 2L5	
Credit Valley Conservation	Planning		planning@cvc.ca	1255 Old Derry Road	Mississauga	ON	L5N 6R4	905-670-1615
Credit Valley Conservation	Sr. Manager, Infrastructure and Regulations	Jakub Killis	jakub.killis@cvc.ca	1255 Old Derry Road	Mississauga	ON	L5N 6R4	905-670-1615 x287
Regional/Local Agencies								
Region of Peel	Commissioner of Public Works	Kealy Dedman	kealy.dedman@peelregion.ca	10 Peel Centre Drive, Suite A and B	Brampton	ON	L6T 4B9	
Region of Peel	Technical Analyst, Infrastructure Programming and Studies	Asha Saddi	asha.saddi@peelregion.ca	10 Peel Centre Drive, Suite A and B	Brampton	ON	L6T 4B9	905-791-7800 x7794
Region of Peel	Manager of Infrastructure Programming and Studies	Sally Rook	sally.rook@peelregion.ca	10 Peel Centre Drive, Suite B, 4th Floor	Brampton	ON	L6T 4B9	
Heritage Mississauga			info@heritagemississauga.org	1921 Dundas St. W.	Mississauga	ON	L5K 1R2	905-828-8411
Cooksville Business Improvement Area			https://cooksvillebia.ca/contact-us					

Organization	Position	Name	Email	Address	City	Province	Postal Code	Phone
Cooksville Munden Park Homeowners Organization (CMPHO)	President	Andrew Gassmann	[REDACTED]					
Indigenous Communities								
Mississaugas of the Credit First Nation	Chief	R. Stacey Laforme	communications@mncfn.ca					
Huron Wendat Nation		Mario Gros-Louis	mario.groslois@cnhw.qc.ca					
		Louis Lesage	louis.lesage@cnhw.qc.ca					
		Mélanie Vincent	melanievincent21@yahoo.ca					
Six Nations of the Grand River	Chief	B. Mark Hill	markhill@sixnations.ca					
Haudenosaunee Confederacy Chiefs Council c/o Haudenosaunee Development Institute (HDI)	Environmental Supervisor	Raechelle Williams	janicewilliams@hdi.land					
Utilities / Service Providers								
Alectra Inc.	Manager, Capital Projects	Patrick Leung	patrick.leung@alectrautilities.com; recordsmississauga.info@alectrautilities.com	2185 Derry Road West	Mississauga	ON	L5N 7A6	1-833-253-2872 ext. 24418
Hydro One	Director, Environmental Services	Elise Croll	elise.croll@hydroone.com; secondarylanduse@hydroone.com					
Enbridge	Planning Manager	Ashutosh Kahol	ashutosh.kahol@enbridge.com; notfications@enbridge.com mark-ups@enbridge.com					
Bell Canada		Meaghan Palynchuk	meaghan.palynchuk@bell.ca					
	Municipal Relations/Planning & Development General Mailbox		planninganddevelopment@bell.ca					
Veridian Connections	Engineering Supervisor	Ken Gallen	kgallen@veridian.on.ca					
Trans-Northern Pipelines Inc.	Property Administrator	Sandrine Exibard-Edgar	seedgar@tnpi.ca					
Rogers Communication		Lily Apa	lily.apa@rci.rogers.com					
Telus		Indira Sharma	indra.sharma@netricom.com					
Local Residents**/Special Interest Groups (requested to be added to list)								
2100 Camilla Road	Land Owner	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
PCC 38	President	[REDACTED]	[REDACTED]	[REDACTED]	Mississauga	Ontario	[REDACTED]	[REDACTED]
Alba Property Management	Property Manager for Sherobee Road properties (PCC 38)	[REDACTED]	[REDACTED]	[REDACTED]				
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]	Mississauga	Ontario		
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]				[REDACTED]
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]	Mississauga	Ontario		[REDACTED]
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]				[REDACTED]
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]				[REDACTED]
Local Resident		[REDACTED]	[REDACTED]	[REDACTED]				[REDACTED]

Notes:

* City provides correspondence to Councillor and other internal City groups (i.e. Parks, etc.)

** Notices dropped off at homes backing onto study area. See attached notification limits map.

Public Notices & PIC Materials

CITY OF MISSISSAUGA – NOTICE OF STUDY COMMENCEMENT

Municipal Class Environmental Assessment Study:
Cooksville Creek Erosion Control Project at Camilla Road

WHAT?

- The City of Mississauga is undertaking a Schedule B Municipal Class Environmental Assessment (Class EA) Study for erosion control and restoration of Cooksville Creek at Camilla Road.



WHY?

- Through its ongoing erosion monitoring program, the City of Mississauga recognizes that this section of Cooksville Creek needs rehabilitation to address existing erosion issues and provide an opportunity to naturalize the site.

HOW?

- The study will examine the creek and associated natural resources to identify existing erosion problems, potential future risks, and opportunities for restoration and environmental enhancement.
- Through the Class EA process, multiple alternative solutions will be developed and evaluated by the Study Team and refined through public and agency consultation (see below). The Study Team will then select a preferred alternative and proceed with design of the recommended works.
- At the end of the study, a Project File documenting the study process will be available for public review.
- Over the coming months, Study Team members will be visiting the site to document existing conditions to support the evaluation of alternative solutions.

GET INVOLVED!

- Consultation is an important part of the Class EA process. Public input and comment are invited for incorporation into the planning and design of this project.
- A Public Information Centre (PIC) will be held to present the study findings, the alternative solutions being considered, and to answer any questions you may have. Details regarding the PIC will be advertised publicly as the study progresses.
- Project information will be made available to the public on the City's project website: <http://www.mississauga.ca/cooksvillecamillastudy>
- If you have any questions or comments regarding the study or wish to be added to the study mailing list, please contact:

Anthony DiGiandomenico, P.Eng.

Project Manager

City of Mississauga

201 City Centre Dr, Suite 800

Mississauga, ON L5B 2T4

(905) 615-3200 ext. 3491

anthony.digiandomenico@mississauga.ca

Mark Bassingthwaite, P.Eng.

Consultant Project Manager

Resilient Consulting Corp.

PO Box 643

Whitby, ON L1N 5V3

(289) 943-4651

mbassingthwaite@resilientconsulting.ca

COVID-19 Community Engagement Update: While we continue to respond to this pandemic, we are working hard to deliver essential services and projects to keep our city moving and safe. While we can't connect in person at this time, we still want to connect! Opportunities to connect with the Study Team are noted above.

This notice signals the commencement of the Class EA, a study which will define the problem, identify/evaluate alternative solutions, and determine a preferred design in consultation with regulatory agencies and the public. The study is being undertaken in accordance with the planning and design process for Schedule 'B' projects, as outlined in the "Municipal Class Environmental Assessment" document (October 2000, amended in 2015), which is approved under the Ontario *Environmental Assessment Act*.

Personal information is collected under the authority of the *Environmental Assessment Act* and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed above.

This notice was first issued October 28, 2021.



Notice Deliveries
 Cooksville Creek
 City of Mississauga
 October 2021

Figure

1

CITY OF MISSISSAUGA – NOTICE OF ONLINE PUBLIC INFORMATION CENTRE

Municipal Class Environmental Assessment Study:
Cooksville Creek Erosion Control Project at Camilla Road

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WHY?

- Through its ongoing erosion monitoring program, the City of Mississauga recognizes that this section of Cooksville Creek needs rehabilitation to address existing erosion issues and provide an opportunity to naturalize the site.

HOW?

- The study has examined the creek and associated natural environment to identify existing erosion problems, potential future risks, and opportunities for restoration and environmental enhancement.
- Through the Class EA process, four alternative solutions were developed and evaluated by the study team. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourestone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road.** The preferred solution will be confirmed, and the details refined through public consultation (see below).
- At the end of the study, a Project File Report to document the study process, project details, and consultation results will be made available for public review.

GET INVOLVED!

- Consultation is an important part of the Class EA process. We want to ensure that anyone with an interest can provide input into the planning and design of this project.
- A narrated presentation and downloadable information package have been developed to present the study findings, alternative solutions considered, the evaluation process, preliminary preferred solution, and next steps. The information is now available from **April 13 to May 4, 2022**, on the City's project website:

<http://www.mississauga.ca/cooksvillecamillastudy>

- Please provide your comments by **May 4, 2022**, using the Comment Form available online or by contacting one of our study team members listed below.
- Having trouble accessing the materials? Need more information or wish to be added to the project mailing list? Contact us by mail, phone, or email at:

Anthony DiGiandomenico, P.Eng.

Project Manager

City of Mississauga

201 City Centre Dr, Suite 800

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COVID-19 Community Engagement Update: While we continue to respond to this pandemic, we are working hard to deliver essential services and projects to keep our City moving and safe. While we can't connect in-person at this time, we still want to connect! Opportunities to connect with the Project Team and share your input are noted above.



City of Mississauga

Cooksville Creek Erosion Control Project at Camilla Road

Online Public Information Centre (PIC)



Published: April 13, 2022.



Study Purpose

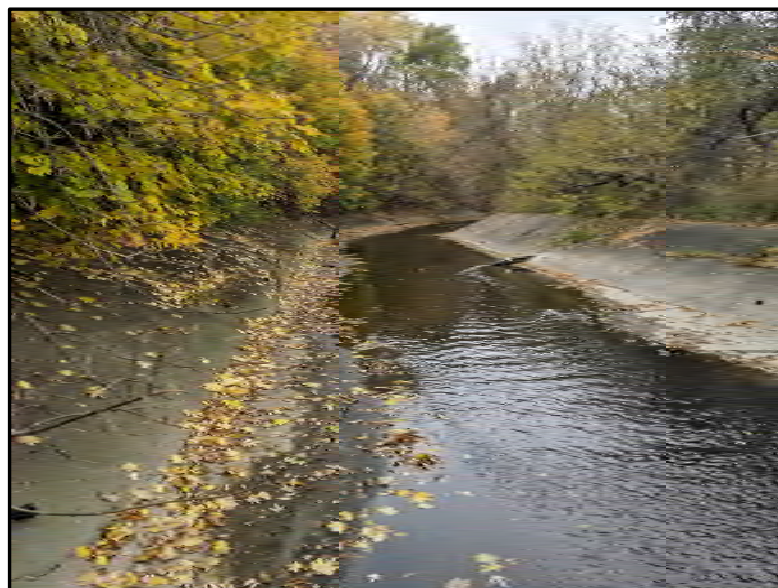
- The Cooksville Creek Erosion Project at Camilla Road is being completed as a Schedule B Municipal Class Environmental Assessment (EA) Study.
- This study will identify and evaluate a range of design options for upgrading the existing channel to address erosion issues and provide opportunity to naturalize the site.
- The purpose of this Public Information Centre (PIC) is to:
 - Present study background information and proposed alternatives for the restoration of Cooksville Creek;
 - Outline how each alternative was evaluated;
 - Recommend a preferred alternative;
 - Provide a timeline of upcoming steps; and
 - Provide the public an opportunity to submit comments.





Study Area

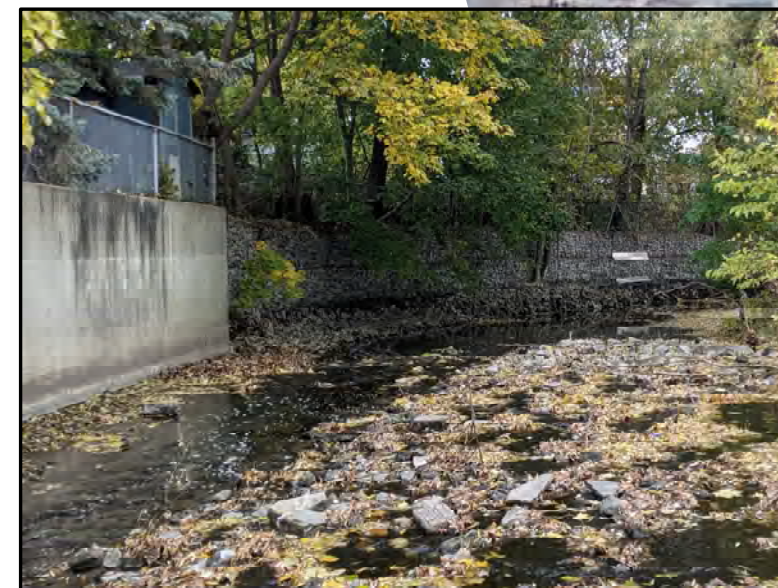
- Cooksville Creek originates in the industrial lands north of Highway 403 before flowing through the study area at Camilla Road and ultimately discharging to Lake Ontario at Helen Molasy Park.
- This section of Cooksville Creek spans 200 metres and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled Gabion basket walls and concrete-lined channel.



Upstream of Camilla Road
Trapezoidal concrete channel
(Looking Upstream facing West)



Bridge at Camilla Road
3-cell culvert
(Looking Downstream facing East)



Downstream of Camilla Road
Channel banks transition from concrete
vertical wall to Gabion baskets
(Looking Downstream facing East)



Problem or Opportunity Statement

Problem

The City has identified this section of Cooksville Creek as a high priority site in need of rehabilitation. This section of the creek is entirely channelized via a trapezoidal concrete structure or lined with concrete and Gabion baskets. These Gabion baskets have failed, and the channel walls are slumping and undermined. The concrete-lined channel has a fractured bed and banks, and there is a significant amount of accumulated sediment, debris, and vegetation growth obstructing the channel, further reducing its ability to properly drain surface water to Lake Ontario. The deteriorating channel poses a potential risk to infrastructure, private property, and the environment.

Opportunity

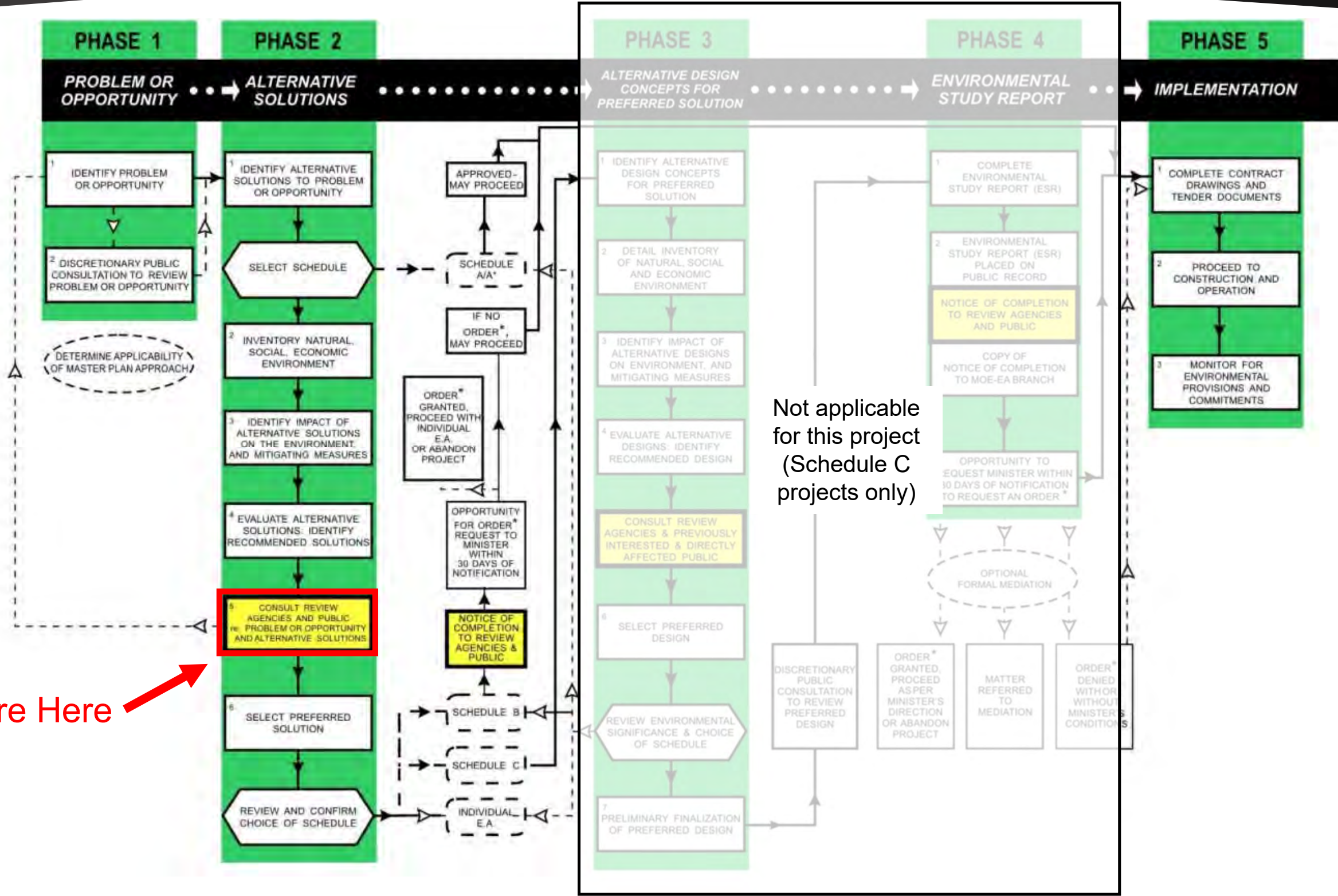
There is an opportunity to rehabilitate or replace the channel to mitigate potential risks. Project objectives include:

- Providing long term erosion protection compatible with the creek;
- Maintaining the hydraulic capacity of the creek;
- Replacing the hardened creek bed and banks with more “natural” forms of erosion and grade control;
- Providing environmental enhancements and improving fish habitat and fish passage;
- Decreasing risk of property and infrastructure loss; and
- Reducing the City’s maintenance costs.



Municipal Class EA Overview

- The Municipal Class EA process is a decision-making and planning process that ensures that potential effects of a project are identified and managed prior to implementation.
- The Class EA process applies to routine public sector projects that have predictable and manageable environmental effects, such as municipal road, water and wastewater projects.
- The process requires the identification and evaluation of possible alternative solutions and design concepts, and recommends the best approach based on evaluation.
- The Class EA study is undertaken in accordance with the requirements of the Ontario *Environmental Assessment Act*, as prescribed by the Municipal Engineers Association Municipal Class EA document (2000, as amended in 2007, 2011 and 2015).
- This study will address the requirements of Phases 1 and 2 of a Schedule 'B' project under the Municipal Class EA process.



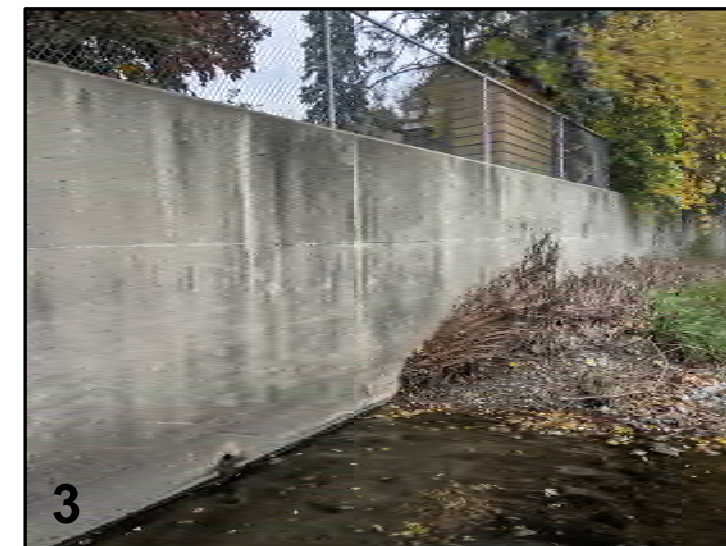
We Are Here

Not applicable for this project (Schedule C projects only)



Existing Infrastructure

- The channel includes a 3-cell culvert at Camilla Road, with an overflow cell along the south bank. The culvert appears to be in good condition, but sediment and debris has begun to accumulate within the structure.
- Cooksville Creek upstream (west) of Camilla Road consists of a trapezoidal concrete structure in poor condition.
- Downstream (east) of Camilla Road, the creek has banks that transition from a concrete vertical wall to a Gabion basket wall. The Gabion baskets have either failed or are at risk of failure due to undermining along the bank.
- The nearby Hydro One corridor is outside the study area.



1. View inside Camilla Road culvert
2. Trapezoidal concrete channel (looking downstream)
3. Concrete wall along creek bank
4. Failed Gabion baskets along creek bank



Existing Natural Conditions

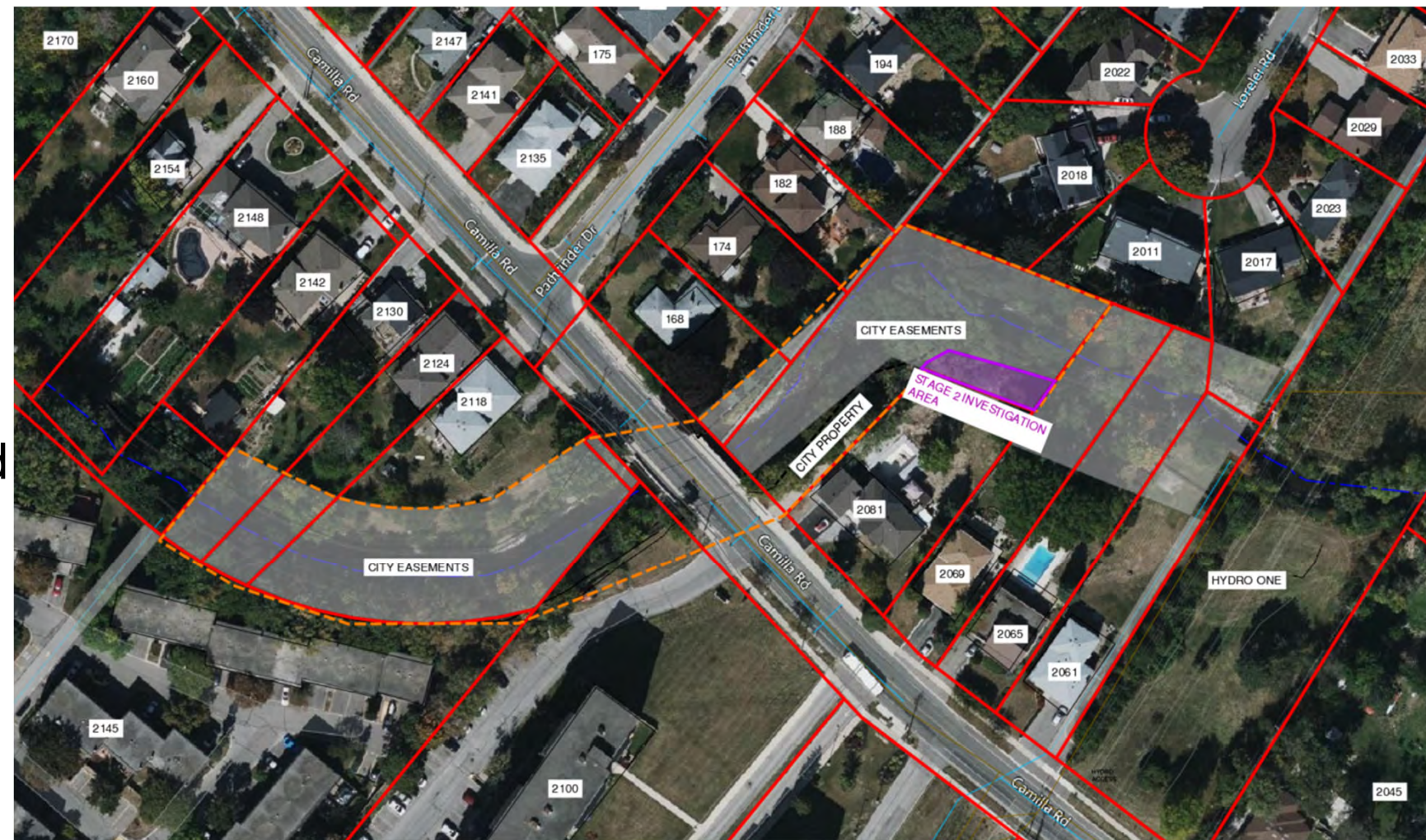
- Cooksville Creek outlets into Lake Ontario at Port Credit. It is a warmwater watercourse that may provide limited fish habitat, though no fish were observed during surveys and fish habitat is limited due to channel design.
- Treed vegetation within the study area is dominated by dead or dying Ash trees (*Fraxinus spp.*), as well as Willows (*Salix spp.*), Manitoba Maple (*Acer negundo*) and Norway Maple (*Acer platanoides*). Invasive species include European Buckthorn (*Rhamnus cathartica*), Garlic Mustard (*Alliaria petiolata*), European Common Reed (*Phragmites australis ssp. australis*), and Japanese Knotweed (*Reynoutria japonica*).
- No Species at Risk were observed in the study area during field investigations, though some are known to be present in the general area.
- No confirmed Significant Wildlife Habitat is known from the study area.





Existing Socio-Cultural Conditions

- This 200-metre section of Cooksville Creek backs onto low, medium, and high-density residential areas east and west of Camilla Road. The majority of the channel is located on lands owned by the City or have City easements for creek improvement purposes.
- Camilla Road is a minor collector road with dedicated bicycle lanes identified by signs and pavement markings.
- The preliminary archaeological assessment determined that a small part of the study area east of Camilla Road retains archaeological *potential* and requires a Stage 2 Investigation. Test-pitting (by hand) will be required to confirm no archaeological resources exist.





Indigenous Community Notification

The Ontario Ministry of Environment, Conservation and Parks (MECP) has notified the City that this proposed project *may* have the potential to affect Aboriginal or treaty rights protected under Canada's *Constitution Act* (1982). The following communities have been identified as potentially affected:

- Haudenosaunee Confederacy Chiefs Council
- Huron-Wendat Nation
- Mississaugas of the Credit First Nation
- Six Nations of the Grand River

These communities have been notified of this project.

To date, correspondence has been received from the Huron-Wendat Nation and the Mississaugas of the Credit First Nation. Both wish to be involved, including in future archaeological investigations.

Recent amendments to Ontario's *Environmental Assessment Act* note that a Part II Order or "bump-up" request will only be considered by the MECP if the project impacts constitutionally protected Aboriginal or treaty rights. Requests on other grounds will not be considered.



Alternatives Solutions

The following alternatives were developed and evaluated in accordance with Phase 2 of the Municipal Class EA process:

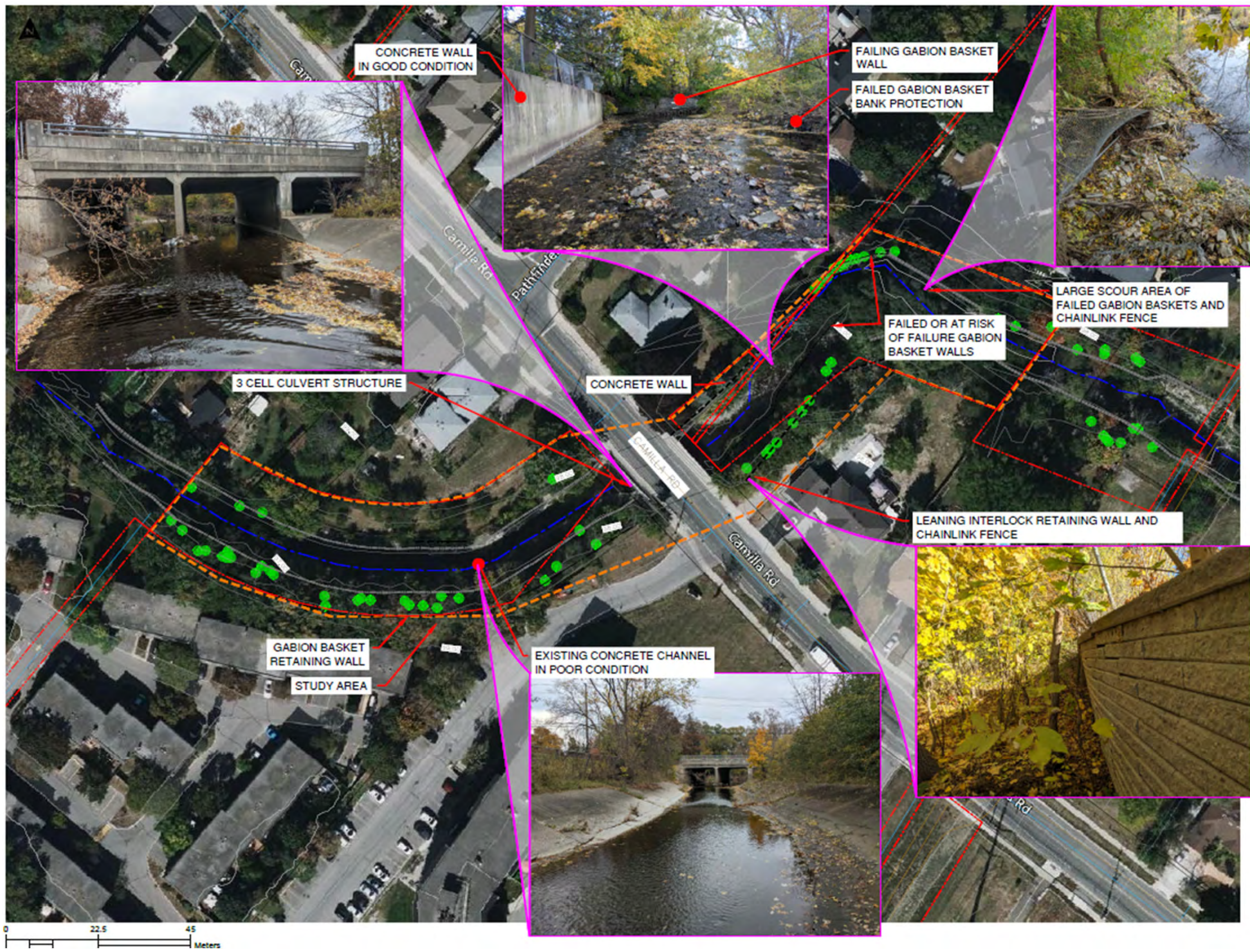
1. Do Nothing
2. Local Improvements
3. Reach Scale Improvements
4. Natural Channel Restoration



Alternative #1

'Do Nothing'

- No changes to the existing channel.
- This alternative is used for comparison purposes when evaluating the other alternatives.
- Required as per the Municipal Class EA process.
- Failing channel structures will continue to degrade and increase risk to property and infrastructure.
- No environmental benefit is provided.



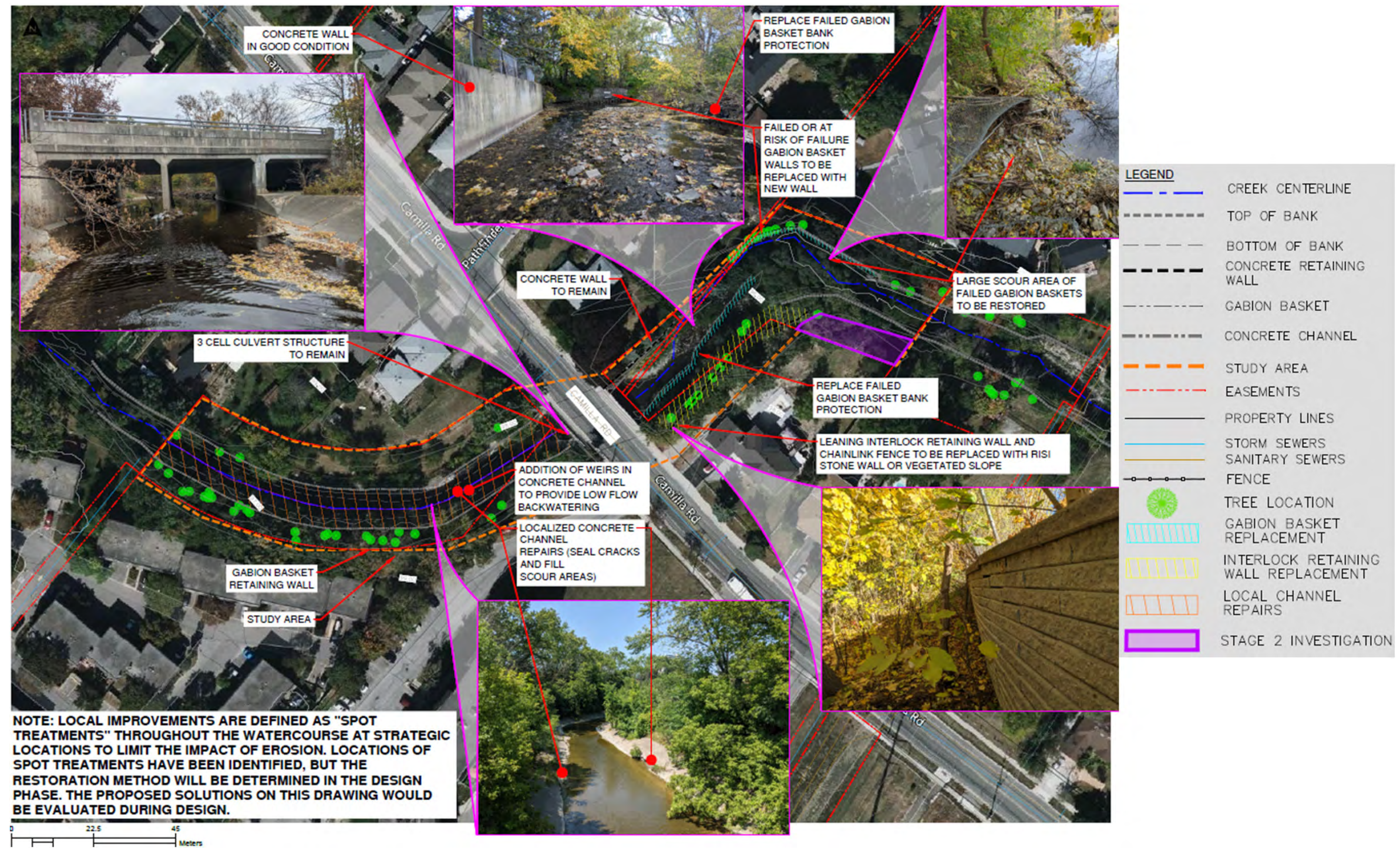
LEGEND	
	CREEK CENTERLINE
	TOP OF BANK
	BOTTOM OF BANK
	CONCRETE RETAINING WALL
	GABION BASKET
	CONCRETE CHANNEL
	STUDY AREA
	EASEMENTS
	PROPERTY LINES
	STORM SEWERS
	FENCE
	TREE LOCATION
	SANITARY SEWERS



Alternative #2

Local Improvements

- Includes “spot treatments” along the channel at strategic locations to limit the impact of erosion.
- Includes filling/repairing cracks and scours in the concrete, replacement of the failed Gabion walls and bank protection with new erosion protection and replacing the leaning interlocking wall with a new protected slope or wall.

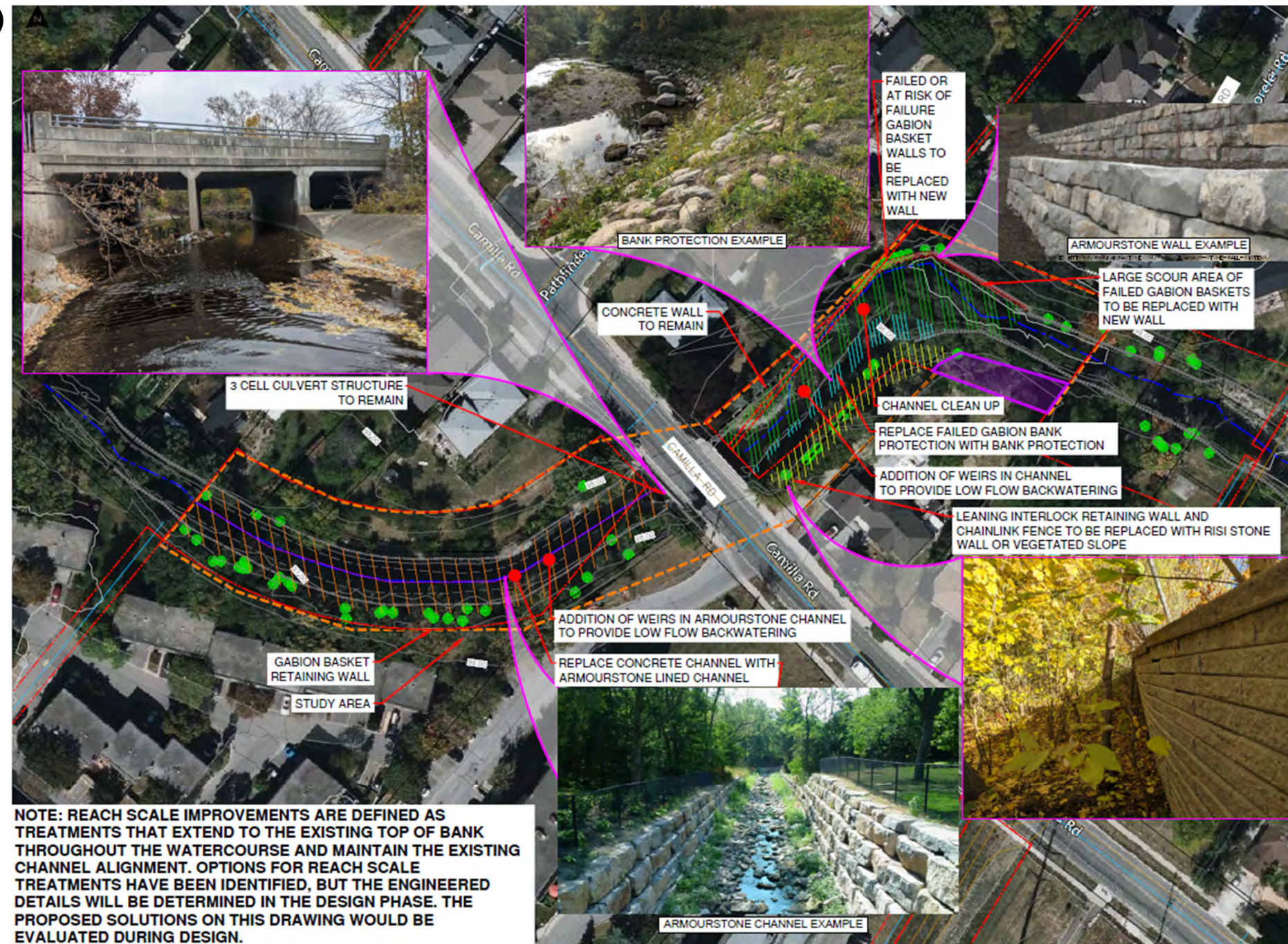




Alternative #3

Reach Scale Improvements

- Includes treatments that extend to the existing top of bank and maintain the existing channel alignment.
- Includes replacement of the concrete channel with an armourstone-lined channel west of Camilla Road and channel improvements east of Camilla Road.
- Includes replacement of the failed Gabion walls and bank protection with new erosion protection and replacing the leaning interlocking wall with a new protected slope or wall.



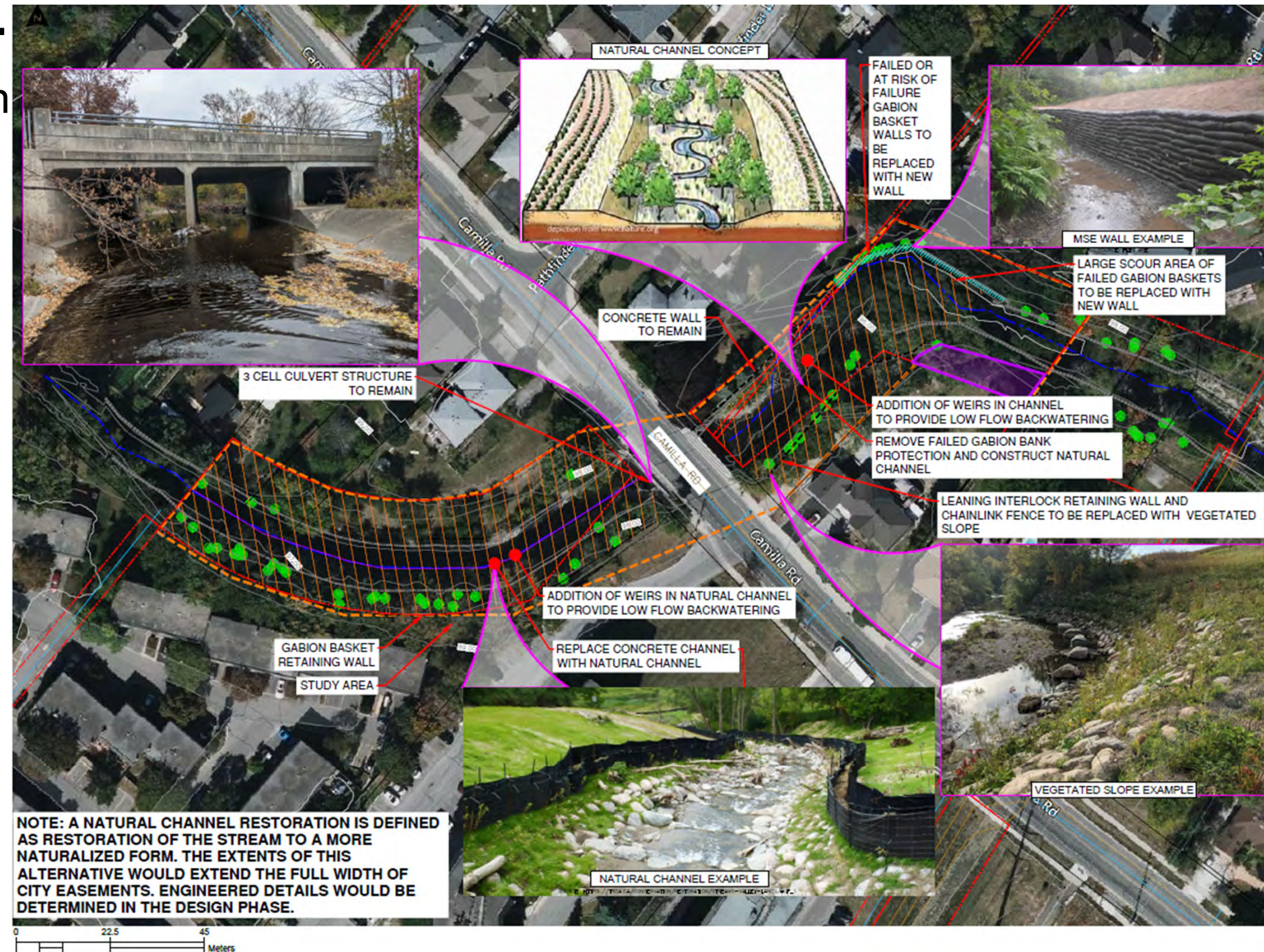
NOTE: REACH SCALE IMPROVEMENTS ARE DEFINED AS TREATMENTS THAT EXTEND TO THE EXISTING TOP OF BANK THROUGHOUT THE WATERCOURSE AND MAINTAIN THE EXISTING CHANNEL ALIGNMENT. OPTIONS FOR REACH SCALE TREATMENTS HAVE BEEN IDENTIFIED, BUT THE ENGINEERED DETAILS WILL BE DETERMINED IN THE DESIGN PHASE. THE PROPOSED SOLUTIONS ON THIS DRAWING WOULD BE EVALUATED DURING DESIGN.



Alternative #4

Natural Channel Restoration

- Stream restoration to a naturalized form.
- Includes watercourse expansion on both sides of Camilla Road to incorporate channel meander and bank protection.
- Failed Gabion walls would be replaced with new sloping walls, extending the full width of the City's easement.





Evaluation Criteria

Technical/Engineering

- Ability to Maintain Hydraulic Capacity (Convey Water)
- Erosion Mitigation
- Constructability
- Site Access

Natural Environment

- Aquatic Habitat Impact/Opportunities
- Terrestrial Habitat Impact/Opportunities
- Sensitive Species Impact/Opportunities
- Water Quality

Economic

- Capital Costs
- Operation and Maintenance Costs

Social/Cultural Environment

- Archaeological and Cultural Heritage Resources Impact/Opportunities
- Adjacent Property Impact/Opportunities
- Indigenous Community Impact
- Temporary Traffic, Noise, Dust Impacts During Construction
- Aesthetics



Evaluation Matrix Slide 1 of 3

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Technical/Engineering				
Ability to Maintain Hydraulic Capacity (Convey Water)	Hydraulic performance will continue to decline due to failure of Gabion banks (stones and chain-link fence framing) and walls and on-going degradation of concrete channel. Existing debris and sediment to continue to accumulate, further obstructing flow within the channel.	Moderate improvement of hydraulic capacity within channel where failing Gabion baskets and leaning interlocking wall obstructs flows. Debris and sediment will continue to create some reduction of hydraulic capacity. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.	Increase in hydraulic performance due to channel restoration/naturalization and debris removal. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.	Full restoration of hydraulic function within stream channel up to top of bank. Opportunity to restore low flow backwatering effects with weir installation within channelized portion of reach.
Erosion Mitigation	Existing Gabion baskets, interlocking wall, and concrete channel will continue to deteriorate, resulting in further erosion of channel banks and sediment release into the watercourse.	Removal of most imminent erosion risks. Potential for continued erosion and scour of concrete channel.	Removal of erosion risks. Long-term stability provided.	Removal of erosion risks. Long-term stability provided.
Constructability	No construction required.	Construction repairs would be completed with relatively small machinery and minor flow diversion would be required. Shortest construction duration.	Construction would require large equipment access and a flow diversion plan. Replacement of concrete channel with an armourstone lined channel would require extensive demolition and material handling. Moderate construction duration.	Most complex and intrusive works required to replace concrete channel with natural channel and interlocking retaining walls with vegetated slope. Longest construction duration.
Site Access	No site access required.	Site would be accessed through City owned property and easements.	Site would be accessed through City owned property and easements.	Site would be accessed through City owned property and easements. May require access through private properties to access top of bank areas outside of City easements.
Natural Environment				
Aquatic Habitat Opportunities	No improvements.	Removal of the failed Gabion baskets which have fallen into the channel would result in a minor improvement to fish habitat and fish passage.	Removal of debris and sedimentation from the channel would result in a moderate improvement to fish habitat and fish passage. Removal and replacement of the concrete bed west of Camilla Road with a natural substrate would result in a moderate improvement to aquatic habitat. Installation of weirs will also improve aquatic habitat.	Natural channel design would result in the greatest improvement to aquatic habitat. Meanders would increase the total length of aquatic habitat, reduce flow velocity, and mitigate ongoing erosion. A natural substrate would create habitat for a variety of aquatic species and provide features and functions such as rest stops for fish, fish spawning areas, fish foraging areas, and habitat for aquatic invertebrates.
Aquatic Habitat Impact	No in-water or near-water works required.	Some in-water and near-water works required. Disturbance can be mitigated.	In-water and near-water works required, more than Alternative #2 but less than Alternative #4. Disturbance can be mitigated.	In-water and near-water works required (more than Alternative #3). Disturbance can be mitigated.
Terrestrial Habitat Opportunities	No improvements. No removal of terrestrial invasive species.	No improvements. No removal of terrestrial invasive species.	Replacing a portion of the Gabion baskets with a natural form of bank protection would result in a minor increase in terrestrial habitat. Replacement of the concrete channel with an armourstone lined channel would also provide an increase to habitat.	Vegetation clearing would result in invasive species removal. Restoration would involve native tree plantings and seedlings, which would result in improved species diversity and habitat use. A naturalized channel provides the highest benefit to terrestrial and aquatic wildlife.

	More Preferred
	Moderately Preferred
	Least Preferred



Evaluation Matrix Slide 2 of 3

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Terrestrial Habitat Impact	No tree removals or other vegetation removals required.	Some tree and other vegetation removals anticipated to be required.	Tree and other vegetation removals anticipated to be required, more than Alternative #2. Replacement of sloped concrete banks with armourstone west of Camilla Road may be a barrier to terrestrial wildlife accessing the creek and aquatic wildlife accessing terrestrial habitat (e.g., turtles accessing potential nesting sites).	Tree and other vegetation removals anticipated to be required, more than Alternative #3. Long-term improvements outweigh short-term impacts.
Sensitive Species Opportunities	No improvements.	Minor improvements for aquatic species (e.g., fish, turtles).	Moderate improvements for aquatic species (e.g., fish, turtles). Removal of partial terrestrial invasive species and installation of native plantings and seedings will improve habitat for terrestrial species (e.g., plants, birds, insects).	Highest level of improvements for aquatic species (e.g., fish, turtles) by creating suitable habitat. Removal of terrestrial invasive species and installation of native plantings and seedings will improve habitat for terrestrial species (e.g., plants, birds, insects).
Sensitive Species Impact	No impacts.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.	Tree removals could impact potential terrestrial Species at Risk (e.g., certain species of bats, birds). Impact can be mitigated.
Water Quality	Further accumulation of debris and sediment in the channel leading to a reduction of water quality over time.	Removal of failed gabion baskets that have fallen into the channel would eliminate locations where debris and sediment accumulate, resulting in a minor improvement to water quality.	Removal of debris and sedimentation from the channel would result in a moderate improvement to water quality.	Natural channel design and restoration plantings and seedings would result in the greatest improvement to water quality. Restoration plantings and seedings will control overland runoff and regulate water temperature. In-channel plants trap sediment and filter pollutants.
Social/Cultural Environment				
Archaeological and Cultural Heritage Resources Impact/Opportunities	No potential impact to cultural heritage resources or potential archaeological resources.	No potential impact to cultural heritage resources. Low potential impact to <i>potential</i> archaeological resources, to be confirmed through Stage 2 Archaeological Assessment.	No potential impact to cultural heritage resources. Low potential impact to <i>potential</i> archaeological resources, to be confirmed through Stage 2 Archaeological Assessment.	No potential impact to cultural heritage resources. Low potential impact to <i>potential</i> archaeological resources, to be confirmed through Stage 2 Archaeological Assessment.
Adjacent Property Impact/Opportunities	Risk of further channel deterioration could result in private property loss.	No loss to adjacent properties. Long-term stability of private property may not be provided as the solution is only for "spot treatments."	No loss to adjacent properties. Long-term erosion protection provided.	Loss of private property/table land within City easements, although long-term erosion protection provided.
Indigenous Community Impact	No potential impacts to Indigenous communities, rights, and interests.	Low potential for impacts to Indigenous communities, rights, and interests. To be confirmed.	Low potential for impacts to Indigenous communities, rights, and interests. To be confirmed.	Low potential for impacts to Indigenous communities, rights, and interests. To be confirmed.
Temporary Traffic, Noise, Dust Impacts During Construction	No temporary nuisances or impacts due to no construction.	Possible minor traffic disturbances along Camilla Road to facilitate limited material transport and truck loading. Possible noise/dust impacts can be mitigated. Shortest construction duration.	Possible traffic disturbances along Camilla Road to facilitate material transport and truck loading. Possible noise/dust impacts can be mitigated. Moderate construction duration.	Traffic disturbances along Camilla Road to facilitate material transport and truck loading. Possible noise/dust impacts can be mitigated. Longest construction duration and associated nuisances.

	More Preferred
	Moderately Preferred
	Least Preferred



Evaluation Matrix Slide 3 of 3

Evaluation Criteria	Alternative Solutions			
	Alternative #1 'Do Nothing'	Alternative #2 Local Improvements	Alternative #3 Reach Scale Improvements	Alternative #4 Natural Channel Restoration
Aesthetics	Appearance of channel will continue to decline due to deterioration of channel infrastructure and further accumulation of debris and sediment.	Minor upgrade to channel appearance in areas with observable structure deterioration.	Channel west of Camilla Road would be greatly improved due to replacement of deteriorating concrete channel with armourstone and a naturalized bottom. Channel naturalization east of Camilla Road would have significant value-added components due to revegetation and habitat creation. Would provide consistency with the watercourse both up and downstream of the site.	Channel on either side of Camilla Road would be greatly improved due to naturalization of deteriorating existing channel. However, a fully naturalized channel could look out of place and would not blend with the watercourse both up and downstream of the site.
Economic				
Capital Costs	No capital costs.	Low capital costs. Interlocking wall and weir installation would require increased equipment and staging costs. Lowest Cost	Moderate capital costs. Concrete channel replacement would require significant materials and disposal costs. Moderate Cost	High capital costs. Restoration would require significant equipment, materials, and disposal costs. Highest Cost
Operation and Maintenance Costs	High costs for future repair of failing structures and possible loss of infrastructure / property damage.	Moderate costs for ongoing monitoring and maintenance of repaired infrastructure. Ongoing concrete patching and Gabion basket repairs would be required as structures undergo erosion forces. Considered a short-term solution.	Low costs for on-going monitoring and maintenance of replaced infrastructure. Some temporary erosion controls required until vegetation is fully established. Considered a long-term solution.	Lowest costs for on-going monitoring and maintenance of replaced infrastructure. Some temporary erosion controls required until vegetation is fully established. Considered a long-term solution.
SUMMARY				
	Failing channel structures will continue to degrade over time and increase local erosion and risk to property and infrastructure. No environmental benefit is provided. Least Preferred	Critical failing infrastructure would be addressed in the short-term. Minimal disturbance and costs associated with "spot treatments". However, does not achieve naturalization of channel and provides minimal environmental benefit. Moderately Preferred	Replacement of failing infrastructure would provide protection for nearby properties from deteriorating banks. Cleanup and naturalization of channel would provide environmental and aesthetic benefits. Most Preferred	Full restoration of channel to "natural" structure and function would provide long-term sustainability of banks and resilience to major flood events/erosion. However, construction would be long and very disruptive and private property would be lost. Results would not "match" watercourse conditions both up and downstream. Moderately Preferred

	More Preferred
	Moderately Preferred
	Least Preferred

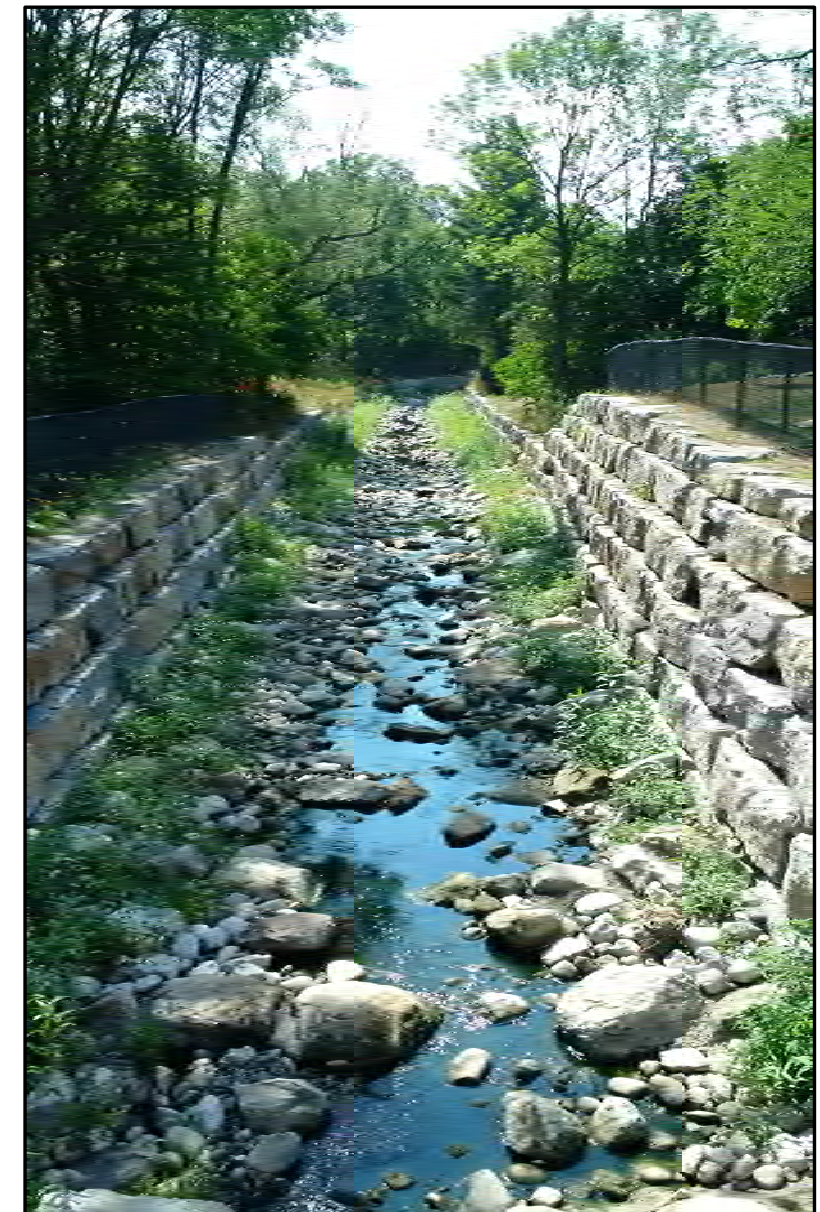


Preferred Alternative Slide 1 of 2

Based on the results of the evaluation, **Alternative #3 – Reach Scale Improvements** best satisfies the Problem or Opportunity Statement and provides the best long-term solution for the City of Mississauga.

Key features of this alternative include:

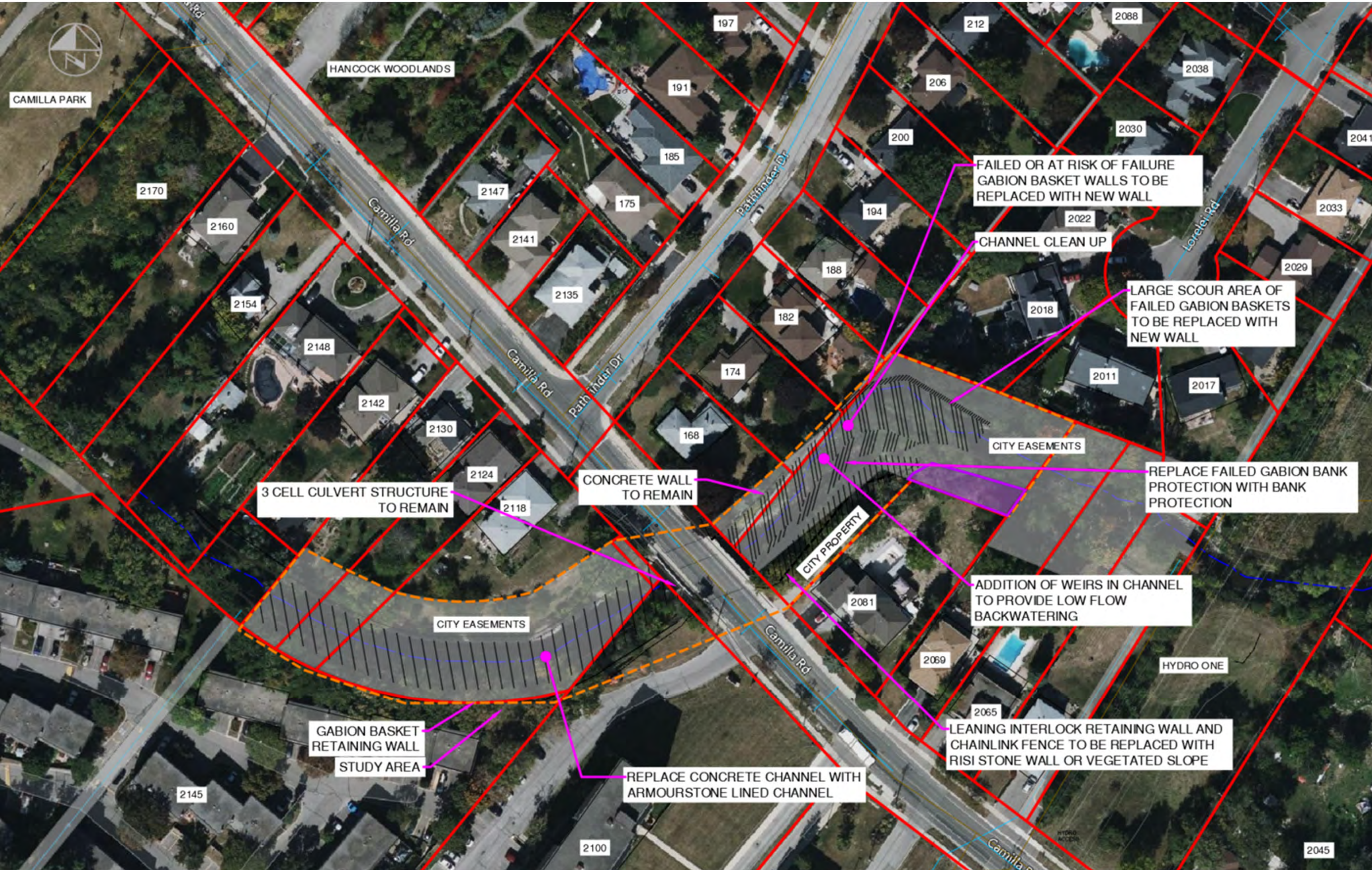
- Provides a moderately natural and “green” solution
- Minimizes disturbance area and vegetation removal
- Reduces erosion risks
- Promotes removal of debris in the channel
- Improves fish habitat and passage through the watercourse
- No loss to private property table land
- Moderate capital costs and low future maintenance costs
- Blends with existing erosion protection surrounding the site



Channel with Armourstone Example



Preferred Alternative Slide 2 of 2



LEGEND	
	CREEK CENTERLINE
	EASEMENT
	TOP OF BANK
	CONCRETE RETAINING WALL
	CONCRETE CHANNEL
	PROPERTY LINES
	STORM SEWERS
	SANITARY SEWERS
	FENCE
	STUDY AREA
2061	LOT NUMBER
	STAGE 2 INVESTIGATION
	RETAINING WALL
	INTERLOCK RETAINING WALL REPLACEMENT
	ARMOURSTONE CHANNEL
	CHANNEL CLEAN UP
	BANK PROTECTION



Next Steps

Following this online PIC, we will:

- Review and consider all comments received
- Confirm the preferred alternative and finalize the preliminary design
- Consider opportunities for phasing of the project to maximize existing infrastructure life cycles
- Complete the Project File Report, which documents the Municipal Class EA planning process followed and the consultation results
- Complete Stage 2 archaeological investigations
- Publish a Notice of Study Completion to advise where and when the Project File Report will be made available for a 30-day public review period

Construction is tentatively scheduled for 2024.



Your Involvement

How can you remain involved in the study?

- Complete a comment form on the project website
- Request that your name/e-mail is added to the project mailing list.
- E-mail questions or comments to the City's representative or Consultant (contact information on next slide).
- Check the City's project website for updates:
www.mississauga.ca/cooksvillemillastudy
- **Deadline for questions and comments is May 4th**

Thank you for your participation.

All information is collected in accordance with the Freedom of Information and Protection of Privacy Act and, with the exception of personal information, will become part of the public record.



For more information please contact:

Anthony Di Giandomenico, P.Eng.
Project Manager, City of Mississauga
Email: anthony.digiandomenico@mississauga.ca
Phone: 905-615-3200 ext. 3491



Mark Bassingthwaite, P.Eng.
Consultant Project Manager, Resilient Consulting
Email: mbassingthwaite@resilientconsulting.ca
Phone: 289-943-4651



Municipal Class E.A. Study: Cooksville Creek Erosion Control Project at Camilla Road

The survey will take approximately 4 minutes to complete.

The City of Mississauga is carrying out a Municipal Class Environmental Assessment Study to address erosion problems in Cooksville Creek at Camilla Road.

Please take a few minutes to complete this form to provide your comments. Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.

* Required

1. Full Name *

2. E-mail Address *

3. Are you a: *

- Homeowner or tenant living near Cooksville Creek
- General member of the public
- Member of an interest group
- Consultant
- Agency representative
- Other

4. Would you like to be added to the project mailing list to receive future notifications? *

- Yes
- No

5. The Study Team is recommending replacement of the existing concrete channel with an armourstone-lined channel west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road. Do you have any comments or concerns regarding this recommended alternative?

6. Do you have any comments or concerns regarding the information presented on existing conditions within the Study Area? Please specify:

7. This study is being conducted as a Schedule 'B' Municipal Class Environmental Assessment (Class EA). Do you have any questions about the Municipal Class EA process? Please specify:

8. Do you have any other comments or questions regarding this study?

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.

CITY OF MISSISSAUGA – NOTICE OF COMPLETION

Municipal Class Environmental Assessment Study: Cooksville Creek Erosion Control Project at Camilla Road

WHAT?

- The City of Mississauga has completed a Schedule B Municipal Class Environmental Assessment (Class EA) Study for erosion control and restoration of Cooksville Creek at Camilla Road.



WHY?

- Through its ongoing erosion monitoring program, the City of Mississauga recognizes that this section of Cooksville Creek needs rehabilitation to address existing erosion issues and provide an opportunity to naturalize the site.

HOW?

- The study has examined the creek and associated natural environment to identify existing erosion problems, potential future risks, and opportunities for restoration and environmental enhancement.
- The Class EA process involved identifying and evaluating various alternative solutions to help mitigate erosion issues. The preferred solution involves:
 - Replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road; and
 - Channel cleanup and new bank protection east of Camilla Road.

PROJECT FILE

- A Project File documenting the Class EA process will be available for a 30-day public comment period starting **March 6, 2024** and ending **April 4, 2024** on the City's project website:

<http://www.mississauga.ca/cooksvillecamillastudy>

- Interested persons are requested to provide written comments to the study team by **April 4, 2024**. All comments are requested to be sent directly to the Project Managers listed below:

Anthony DiGiandomenico, P.Eng.

Project Manager
City of Mississauga
300 City Centre Drive
Mississauga, ON L5B 3C1
(905) 615-3200 ext. 3491

anthony.digiandomenico@mississauga.ca

Mark Bassingthwaite, P.Eng.

Consultant Project Manager
Resilient Consulting Corp.
PO Box 643
Whitby, ON L1N 5V3
(289) 943-4651

mbassingthwaite@resilientconsulting.ca

- If you have concerns about the project that cannot be resolved through discussion with the City, a Section 16 Order request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study, known as an Individual Environmental Assessment, or that conditions such as additional studies be imposed prior to construction. The request may only be made 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 must include your contact information and full name.
- The Section 16 Order request should be sent in writing or by email by **April 4, 2024** to both contacts below with a copy to Anthony DiGiandomenico at the City:

**Minister of the Environment,
Conservation and Parks**

Ministry of the Environment,
Conservation and Parks
777 Bay Street, 5th Floor
Toronto, ON M7A 2J3
minister.mecp@ontario.ca

**Director, Environmental Assessment
Branch**

Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5
EABDirector@ontario.ca

- For more information on Section 16 Order requests under the *Environmental Assessment Act*, visit the Ministry's website at:
<https://www.ontario.ca/page/class-environmental-assessments-section-16-order>
- If no Section 16 Order requests are received, the City intends to proceed with the project subject to other approval requirements as outlined in the Project File.

Personal information is collected under the authority of the *Environmental Assessment Act* and will be used for the purpose of a public record in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments shall become part of the public record. Questions about this collection should be directed to the City's Project Manager listed above.

This notice first issued **March 6, 2024**.

Public Communications

From: [REDACTED]
Sent: November 5, 2021 9:22 PM
To: anthony.digiandomenico@mississauga.ca; Mark Bassingthwaite
<mbassingthwaite@resilientconsulting.ca>
Subject: Cooksville Creek Erosion Control at Camilla Rd Study

My wife and I have lived at [REDACTED] Camilla Rd for the past 35 years and have watched the changes in the creek behind our house due to the erosion of the west side of the creek.

A few years ago, there was a collapse of the rock retaining wall on the east side and since then the erosion on our side has accelerated because of the change in the water flow coming around the bend. Just this year, we preemptively took down a large tree at the edge of the creek before the erosion around it would cause it to fall in.

We are very interested in this project and the proposed solutions to this problem

Please add our names to the mailing list :

[REDACTED]
[REDACTED]

Thanks very much

[REDACTED]

From: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>
Sent: November 11, 2021 4:53 PM
To: [REDACTED]
Cc: [REDACTED] Mark Bassingthwaite
<mbassingthwaite@resilientconsulting.ca>
Subject: RE: Cooksville Creek Study

Good afternoon [REDACTED]

Thank you for the follow-up email.

Further to my voicemail from yesterday, we appreciate your interest in this erosion control project and look forward to your input into the study as it progresses.

As requested, and by copy to Mark, we will add both yourself and George to the project mailing list.

Thanks again,
Anthony



Anthony Di Giandomenico P.Eng.
Storm Drainage Engineer, Environmental Services
T 905-615-3200 ext.3491
anthony.digiandomenico@mississauga.ca

[City of Mississauga](#) | Transportation & Works Department
Infrastructure Planning & Engineering Division

From: [REDACTED]
Sent: 2021/11/11 3:03 PM
To: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>;
mbassingthwaite@resilientconsulting.ca
Cc: [REDACTED]
Subject: Cooksville Creek Study

Good day Anthony, Mark,

Further to my calls yesterday . Many thanks for the call backs.

We wanted to get involved with this study as the creek is a major worry for our residents on PCC 38.

Over the years we have had some serious high water levels and several years ago one major catastrophe where nearly 50% of our basements were flooded out with insurance claims being close to \$1m for fixes and clean up, and rebuilding.

I personally was part of the Mayors task force for going forward and hence the Matheson pond was born out of the various inputs from the committee members.

Now that the city is well on its way to procuring approximately 30 flood plain properties around Paisley Blvd, Sheperd Ave , Frayne and Adena for the future Centre Park and underground storage, the last hurdle is the MTO and the QEW creek culvert which has always been in discussion from many studies going back many tens of years, but sadly was missed out of the QEW interchange redesign a few years ago.

So we have a lot of history living along the creek for many years.

We request that we be included in any study , Zoom meetings etc going forward.

This note is copied to our property manager under Alba, [REDACTED]

Regards

[REDACTED]
President PCC 38
[REDACTED]
[REDACTED]

Sent from [Mail](#) for Windows

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Date: Tuesday, June 7, 2022 at 8:29:50 AM

From: Jennifer Whittard

To: [REDACTED]

CC: Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo

Hi [REDACTED],

Thank you very much for this information. The study area was selected focusing on addressing key at-risk infrastructure, including the failing concrete channel upstream of the Camilla Road bridge and the failing gabion walls at the outer bend downstream of the bridge. As the creek behind your house is in a more naturalized state with banks in fair condition, and was identified by our fluvial geomorphologist as being relatively stable, we are not planning any works in this area.

As noted in my earlier email, and it's worth noting again, energy dissipation in the study area will be a critical element during the design of the preferred alternative. Energy dissipation elements such as armourstone or rock weirs will be used to dissipate erosive forces in the creek, which should help limit erosion occurring downstream of the study area.

To help address any erosion concerns downstream of the study area, we recommend homeowners maintain an approximate 4 metre (m) wide, no-mow, naturalized buffer along the edge of the creek to promote soil stability through deeper root establishment.

The City has an extensive creek monitoring program that regularly monitors all creeks and rivers throughout the City. As part of that program, the City will continue to monitor and re-evaluate this stretch of Cooksville Creek on a regular basis.

We appreciate you taking the time to provide your thoughtful comments and share this information with us.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: [REDACTED]

Date: Tuesday, May 10, 2022 at 9:32 AM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Thanks for your reply.

I am not a fluvial geomorphologist but I disagree with how stable the west side of the creek is. I have lived here for 37 years and have watched the erosion over those years. The collapse of the wall at the corner several years ago exacerbated the erosion, so much so that I had to have a large tree removed before it fell into the creek.

I have pictures from 35 years ago which show the width of the creek at that time plus I have a survey from 1973 which shows the location of the creek 50 years ago. It is at least 10 wider now behind my house.

Extending the erosion control another 150' to the bridge would not at a considerable cost to the project given how much is being spent upstream.

On Tue, May 10, 2022 at 9:53 AM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

Hi [REDACTED],

Thank you for your question and interest in the project. The study area ends between the property lines of 2081 and [2069 Camilla Road](#) and therefore construction will be limited to this area. During our initial site assessments, our fluvial geomorphologist indicated that the banks south of the study area appear relatively stable and do not require further protection. In addition, energy dissipation in the study area will be a critical element during the design of the preferred alternative. Energy dissipation elements such as armourstone or rock weirs will be used to dissipate erosive forces in the watercourse through the study area, which should limit erosion occurring downstream of the site.

In addition to the above, we also suggest leaving a buffer strip of vegetation along the top of the creek bank to help limit erosion. We suggest to limit grass cutting and vegetation trimming in this area.

Please don't hesitate to contact us if you have any further questions.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: [REDACTED]
Date: Thursday, April 14, 2022 at 8:16 AM
To: Jennifer Whittard <jwhittard@resilientconsulting.ca>
Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

I have reviewed all of the materials on the site and asked a specific question about how far along the creek will erosion prevention on the west side of the channel be installed. Will it be as far as the new bridge installed at the path as there is considerable erosion all along this

side?

On Wed, Apr 13, 2022 at 9:09 AM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further details and are now available for review and comment at: <http://www.mississauga.ca/cooksvillemcamillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Response to Your Comments

Date: Friday, August 25, 2023 at 10:12:53 AM

From: Jennifer Whittard

To: [REDACTED]

CC: Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo, [REDACTED]

Hi [REDACTED],

On behalf of the City, thank you for bringing this to our attention. Cooksville Creek is indeed a very flashy urban watercourse and we understand the concern of the residents – these concerns may be voiced to your Ward Councillor.

The 2025 timeline should allow for the acquisition of permitting for approvals and construction as we've been working through some technical issues with the local Conservation Authority. As we work through this, stormwater management facilities continue to be implemented upstream that are supporting the mitigation of peak flows. While these facilities are helping, we understand the toll that summer storms bring and take these concerns seriously. We will do our utmost to adhere to the timeline noted here.

Thanks,
Jen

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: [REDACTED]

Date: Tuesday, August 1, 2023 at 7:25 AM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>, Adam Nespolo <anespolo@resilientconsulting.ca>, [REDACTED]

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Response to Your Comments

Good Morning.

As follow-up to ravine work. Crews are working now to remove many fallen trees. The erosion is continuing to cause significant damage and disruption and all the neighbors connected to the

creek are concerned and will raise complaints.

We've lost several large trees along this small creek area in this summer alone. During a rainstorm the waters raise very high and continue to chew away the landscape.

Looking for confirmation on the plan to move forward, timeline and any thoughts on how me and the neighbors can escalate further. This is also a safety concern as people do walk around the area.

Regards,

[REDACTED]
[REDACTED]

On Mon, May 8, 2023 at 10:58 AM [REDACTED] wrote:

Thank you!

+ [REDACTED] who is my neighbor at [REDACTED]. His property is significantly impacted by the erosion as well.

It is disappointing that the timeline slipped a year and budget still pending. The erosion coupled with build up of debris and garbage is a growing concern that requires attention.

- [REDACTED]

On Mon, May 8, 2023 at 10:51 AM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

Hi [REDACTED],

We appreciate your follow-up and thank you for advising us on the status of the erosion. One of our staff will drop by the site to check current site conditions.

In terms of timing for implementation, the project is now currently scheduled for 2025, subject to Council budget approval, to better reflect the timing needed to complete geotechnical field work and acquire environmental permitting and approvals for construction.

Thanks,

Jen

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner

Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: [REDACTED]
Date: Tuesday, May 2, 2023 at 8:36 AM
To: Jennifer Whittard <jwhittard@resilientconsulting.ca>
Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Response to Your Comments

Good morning.

I wanted to follow-up on below - cooksville creek erosion project - to see if this was firmly in calendar to begin in 2024. The erosion behind my house and neighbors houses is getting increasingly worse.

Thanks,
On Tue, May 10, 2022 at 9:53 AM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

Hi [REDACTED],

Thank you for your comments and interest in the City of Mississauga's Cooksville Creek Erosion Control Project at Camilla Road. A new fence will be constructed on top of the proposed wall behind your property for safety reasons as you have mentioned.

The area will also be replanted with native trees and bushes to compensate for trees removed as part of the project. Many of the trees and bushes in the area are actually invasive species and we anticipate a net benefit to the site following restoration.

The current Municipal Class Environmental Assessment study is anticipated to be completed later this year and email notification will be provided. At this time, construction is anticipated in 2024 and will likely take approximately 4-6 months to complete. Notification will again be provided in advance.

Please don't hesitate to contact us if you have any further questions.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

Subject: Cooksville Creek Erosion Control Project at Camilla Road - Response to Your Comments

Date: Tuesday, May 10, 2022 at 8:52:49 AM

From: Jennifer Whittard

To: [REDACTED]

CC: Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo

Hi [REDACTED],

Thank you for your response to the City of Mississauga's Cooksville Creek Erosion Control Project at Camilla Road. Construction for this project has not yet started and is planned for 2024. We are currently in the public engagement phase of the project as part of the Municipal Class Environmental Assessment (EA) study. We intend to keep the public informed as the project proceeds.

Completion of the Project File (EA report) for this project is tentatively planned for Fall 2022. You will then receive email notification that the Project File is available for review. In the meantime, if you have concerns about current construction in your area, we recommend contacting the City's customer service line by dialling 3-1-1 (or 905-615-4311 outside of the City limits).

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: Anthony DiGiandomenico

Sent: 2023/03/03 7:49 AM

To: [REDACTED]

Subject: Cooksville Creek Erosion Control Project at Camilla Road

Good day [REDACTED],

A colleague of mine, [REDACTED], mentioned that you had inquired about the Cooksville Creek erosion study at Camilla Road and were interested in receiving a project update and finding out what type of work might be completed in the area of your property at 2081 Camilla Road.

In terms of study status, we are currently working through our Environmental Assessment (EA) and have recently been focused on creek modelling work. Once the EA phase has been completed, stakeholders will be notified and a project file will be posted to our webpage for review and comments. We will then start design work and acquiring approvals. At the moment, our best estimate is that construction could begin in 2024 at the earliest, subject to approvals and our EA/design work progressing.

The [PIC information boards](#) show a conceptual idea of what the design could look like for the preliminary preferred solution of Alternative #3 (slides #14, #20, #21). For the portion of creek downstream of Camilla Road bridge, there are several erosion control works planned for the creek banks and bed area. These include the following:

- Removing the leaning retaining wall and chainlink fence on the south bank and replacing it with a vegetated slope or stone wall
- Replacing failed gabion baskets on the outer creek bend with a new bank protection or armourstone wall

- Cleaning up the channel and adding weirs for low flow conditions

The specific type of erosion control feature will be determined as part of our future design work following EA completion.

Trust that provides the answers you're looking for but should you have any other questions please let me know.

Thanks,
Anthony



Anthony Di Giandomenico P.Eng.
Storm Drainage Engineer, Environmental Services
T 905-615-3200 ext.3491
anthony.digiandomenico@mississauga.ca

[City of Mississauga](#) | Transportation & Works Department
Infrastructure Planning & Engineering Division

From: [REDACTED]
Sent: 2022/10/19 5:38 PM
To: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>
Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Thank you very much Anthony for the detailed clarification.

I will contact MTO to inquire about future upgrades to the culvert under the QEW.

Rgds,

[REDACTED]
[REDACTED]

On Oct 19, 2022, at 5:10 PM, Anthony DiGiandomenico
<Anthony.DiGiandomenico@mississauga.ca> wrote:

Good day [REDACTED],

The occurrences of flooding for Cooksville Creek are primarily related to the urban and developed nature of the watershed and increasing frequency of high intensity storm events such as the July 8, 2013 event.

It's important to note that the main purpose of this project is to address existing erosion problems within the creek and it is not a flood mitigation project. However, a separate flood study for Cooksville Creek was previously completed by the City with the objective of reducing the occurrences of riverine flooding for homes and properties adjacent to the creek across the entire watershed.

Initiatives recommended from that study included flood storage (stormwater ponds) in upstream locations to reduce flows to the creek, capacity upgrades to the creek, berming and local control measures. These initiatives have been constructed, are underway or are planned for future implementation as part of the City's Stormwater program. The stormwater pond constructed in Saigon Park is one example and details on that project can be found [here](#). The Cooksville Creek flood study can be found [here](#).

There are also specific local conditions throughout the watershed that impact the ability to reduce flooding. Specific to your neighbourhood, the existing culvert under the QEW currently acts as a pinch point or restriction during certain storm events creating a backwater effect upstream. The culvert is owned by the Ontario Ministry of Transportation (MTO) and we are not aware of any current plans by the MTO to replace this structure.

While completely eliminating the risk of flooding across the watershed is challenging, through the flood study initiatives we are able to reduce the occurrences of flooding and provide an overall improvement.

Trust that provides some insight into these issues.

Thank you,
Anthony

From: [REDACTED]
Sent: 2022/10/17 6:07 PM
To: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>
Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Good day Anthony,

Thank you for the response and hope the actual work will commence in 2024.

A month after I moved to Camilla my neighbours informed me of the flooding that occurred in 2013.

I am very concerned with what happened and wonder if you can you advise what was the root cause of the floods and if the city of Mississauga took any measure to mitigate this issue.

Rgds,

[REDACTED]
[REDACTED]

On Oct 17, 2022, at 4:42 PM, Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca> wrote:

Good day [REDACTED],

Thanks for reaching out and for your interest in the study.

We're currently progressing through the Environmental Assessment (EA) study phase of the project and then will begin design work and acquiring project approvals. Once the EA phase has been completed, stakeholders will be notified and a project file will be posted to our webpage for review and comments. At the moment, our best estimate is that construction could begin in 2024 at the earliest, subject to approvals and our EA/design work progressing.

As outlined in our past Public Information Centre (PIC) materials, which are available on the [project webpage](#), our preliminary preferred solution includes a potential replacement of the leaning interlock retaining wall north of your property with a new protected slope or wall. This existing wall runs east-west along the south bank of the creek and is located within City property. As we begin the design phase of the study, we expect the new slope or wall will be contained within these lands and be reasonably set back from your property.

We are also continuing to complete environmental field work in the area and may be notifying you in the future of any nearby field work planned to take place.

As requested, we will add your email to the project mailing list to receive future study updates.

If you have any other questions, please don't hesitate to let me know.

Thank you,
Anthony



Anthony Di Giandomenico P.Eng.
Storm Drainage Engineer, Environmental Services
T 905-615-3200 ext.3491
anthony.digiandomenico@mississauga.ca

[City of Mississauga](#) | Transportation & Works Department
Infrastructure Planning & Engineering Division

From: [REDACTED]
Sent: 2022/10/14 12:12 AM
To: Anthony DiGiandomenico
<Anthony.DiGiandomenico@mississauga.ca>
Subject: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Good day Anthony,

My name is [REDACTED], I am a recent owner and currently living at [REDACTED] Mississauga Ontario.

I heard about the subject project and would like to know if the project has been approved and a date been set to commence the work.

Furthermore, I would greatly appreciate to be added to the mailing list to receive further notifications.

Rgds,

[REDACTED]
[REDACTED]

----- Forwarded message -----

From: **Jennifer Whittard**

<jwhittard@resilientconsulting.ca>

Date: Wed, Apr 13, 2022 at 9:09 AM

Subject: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

To:

Cc: Anthony DiGiandomenico

<Anthony.DiGiandomenico@mississauga.ca>,

Mark Bassingthwaite

<mbassingthwaite@resilientconsulting.ca>

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution

is replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road. The PIC materials provide further details and are now available for review and comment at: <http://www.mississauga.ca/cooksvillemcamillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP

Senior Environmental Planner

Resilient Consulting

PO Box 643

Whitby, ON L1N 5V3

www.resilientconsulting.ca

@resilientccorp

Review Agency Communications

Subject: Re: CVC's Preliminary comments - EA 21/012 - Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Date: Wednesday, December 8, 2021 at 11:23:49 AM

From: Jennifer Whittard

To: Ahmad, Iftekhar

CC: Kilis, Jakub, anthony.digiandomenico@mississauga.ca, Mark Bassingthwaite, Adam Nespolo

Attachments: image001.jpg

Hi Iftekhar,

Received, thank you. We will be sure to invite CVC to future meetings and reach out regarding the hydraulic analysis. We'll also contact you again if we have any questions regarding the information below.

Yes, please send the invoice to Anthony's attention.

Thanks,
Jen

From: "Ahmad, Iftekhar" <lftekhar.Ahmad@cvc.ca>

Date: Tuesday, December 7, 2021 at 3:27 PM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: "Kilis, Jakub" <Jakub.Kilis@cvc.ca>, "anthony.digiandomenico@mississauga.ca" <anthony.digiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: CVC's Preliminary comments - EA 21/012 - Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Hi Jennifer,

CVC staff have now had the opportunity to review the Notice of Commencement (NOC) and the study area (based on CVC mapping) and provide these high level preliminary comments for your consideration.

CVC Comments

1. It is our understanding that the City through its ongoing erosion monitoring program recognizes the need for rehabilitation of the section of Cooksville Creek at Camilla Road to address the existing erosion issues and provide an opportunity to naturalize the site and therefore is currently undertaking the Schedule B Municipal Class Environmental Assessment study for the proposed erosion control and restoration works within the specified reach.

2. Here are the site characteristics of the subject study area.
 - a. REGULATED AREA - The study area is located entirely within CVC's Regulated Area. A permit from CVC will be required for any grading or construction works within this area.
 - b. WATERCOURSE - The study area is traversed by Cooksville Creek. Any alteration to a watercourse requires a permit from CVC. Our concerns for new construction would be to address the existing channel bank erosion, sediment control during construction, and to ensure no degradation to water quality.
 - c. FLOODPLAIN - The study area is located within the Regulatory Storm Floodplain. A permit will be required from CVC for any construction activity in this area. Our primary concern is the protection of life and property from flood hazard. We have specific criteria and requirements for construction in the floodplain.
 - d. VALLEY SLOPE - The study area is traversed by valley slope. Our primary concerns are to protect the environmental integrity of the valley system and to ensure that slope stability is addressed in the proposed erosion control works if any disturbance to the valley slope is proposed.
 - e. SIGNIFICANT WILDLIFE HABITAT - The study area is located within the Significant Wildlife Habitat (SWH) including deer congregation areas and migratory landbird stopover habitat.
 - f. CREDIT RIVER WATERSHED NATURAL HERITAGE SYSTEM (CRWNHS) - The study area is located within the CRWNHS (valleyland). The CRWNHS consists of High Functioning and Supporting terrestrial and aquatic natural heritage features, buffers, and complementary natural heritage areas (Centres for Biodiversity). Based on a watershed scale, the CRWNHS is intended to support Provincial, Regional and local municipal natural heritage systems as identified in their respective Strategies or Plans. As a watershed based management agency and landowner, CVC intends to implement the CRWNHS by using it as a strategic program guidance tool; to inform further development of CVC projects and policies; to assist CVC staff in providing technical advice to landowners and stakeholders on a watershed scale; and to promote a more consistent approach to natural heritage system planning across CVC's jurisdiction. Please contact the undersigned for any further information.
 - g. MISSISSAUGA NATURAL HERITAGE SYSTEM & NATURAL AREAS SURVEY - The study area is located within the City of Mississauga's Natural Heritage System and Urban Forest. The City's Natural Heritage System is made up of Significant Natural Areas, Natural Green Spaces, Special Management Areas, Residential Woodlands and Linkages as described in the City's Official Plan. The study area is also located within the City's Natural Areas Survey and designated as Significant Natural Site (CV8). CVC provides technical support to the City with respect to the identification and delineation of the natural heritage features or areas as well as reviewing proposals for potential negative impacts to the natural features or areas. Please contact City staff for any additional information pertaining to this matter.
3. The extent of the proposed erosion control works are unclear at this time (based on the limited information provided in the NOC). Please note that hydraulic analysis will be required in support of the proposed erosion control works that will involve altering the floodplain and/or channel.

- a. The hydraulic analyses (HEC-RAS modelling) should be completed by a qualified water resources engineer.
 - b. The applicant should contact CVC to obtain the approved hydraulic model for Cooksville Creek and the relevant flood map sheets.
 - c. Please note LiDAR is available within the study area and is available upon data request.
 - d. It is recommended that pre-consultation with CVC staff be completed prior to commencing any hydraulic analysis to discuss the submission expectations.
4. There are several valley slopes within the study area which have slope heights greater than 2 m with slope inclinations at 3:1 which would be considered as slope hazards. Please note that the geotechnical investigation and slope stability analysis would be required if the proposed works involve disturbing or altering the valley slope, and/or altering the slope hazard (by any potential channel restoration works). A slope stability analysis is to be completed in accordance with CVC's Slope Stability Guideline at <https://cvc.ca/wp-content/uploads/2021/06/Slope-Stability-Determination-Guidelines.pdf>. Additional comments regarding the slope stability may be provided at the detailed design stage. It is recommended that pre-consultation with CVC staff be completed prior to commencing any geotechnical work.
 5. At this time, it is unclear whether the proposed erosion works would involve any channel realignment and/or significant bank modification. Please note that an erosion hazard assessment may be required depending on the extent of the proposed erosion control works. Please note that the erosion assessment is to establish both the existing and proposed conditions erosion hazard limit to demonstrate that the proposed works do not result in the offsite impacts to the neighboring properties. It is recommended to consult with CVC staff prior to commencing the erosion hazard assessment for submission expectations.
 6. The proposed erosion control project is located in a warmwater fish community reach of Cooksville Creek. Although they are tolerant species (Cyprinids), taking a sensitive and green approach to the project is most recommended to ensure that fish habitat, passage, and instream cover are accounted for and enhanced where possible. Work should be completed within the warmwater timing window (July 1 to March 31st), in dry weather, and with a comprehensive ESC plan in place. This should be noted in any natural heritage/fisheries report prepared as part of the project.
 7. Considering Significant Wildlife Habitat (SWH) along with other sensitive features such as NAS, the project planning should consider appropriate timing windows and construction/disturbance setbacks, as well as a reduced footprint to the extent possible. The access points and the timing, duration, and location of staging areas should be carefully considered to minimize the ecological footprint.
 8. Please be aware of the updates to and requirements of the Migratory Birds Convention Act which governs the protection and conservation of migratory birds within Canada. Any potentially destructive or disruptive activity such as vegetation clearing should be avoided between April and August. It is the proponent's responsibility to adhere to all pertinent laws, regulations and permit requirements including but not restricted to the Migratory Birds Convention Act and the Migratory Birds Regulations. Further information on the general nesting periods of migratory birds in Canada can be found at <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm->

[migratory-birds/general-nesting-periods/nesting-periods.html](http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html).

9. Given that the works are proposed in or near water, it is the responsibility of the proponent to ensure that works, undertakings or activities do not cause the death of fish or cause the harmful alteration, disruption or destruction of fish habitat under the *Fisheries Act*. Please review the complete list of measures to avoid harm at <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html> and implement those that are applicable to the proposed works. If it is not possible to avoid or mitigate impacts, the proponent can submit a request for review form to its region's Fish and Fish Habitat Protection Program office (via fisheriesprotection@dfo-mpo.gc.ca or 1 855 852-8320). Please refer to the Fisheries and Oceans Canada (DFO) website for additional information.
10. Please contact relevant agencies (NDMNRF, MECP, DFO) for any necessary mitigation opportunities and permit requirements regarding fish, wildlife, and Species at Risk, as appropriate.
11. The NOC has identified that the proposed study will seek opportunities for restoration and environmental enhancement. Where possible, please consider softer bank stabilization techniques throughout the reach. This will contribute to water quality and habitat enhancement.
12. It is highly recommended to include fish passage and terrestrial wildlife passage as a goal within the proposed project.

Given our interest in the proposed project, CVC staff would like to be kept informed of future meetings and proceedings throughout the EA study. We also request to be invited to participate on any Technical Advisory Committee that may be formed for this EA. Please forward any information or reports when available to ensure that this Authority's policy and program interests are reflected in the planning and design components of the project. CVC's EA review fee for this project is \$2500 plus any applicable future permit fees. The fee can be paid quoting the file number EA 21/012 or CVC can issue an invoice to the attention of City's PM (Anthony DiGiandomenico) if preferred.

If you have any questions on the above comments, please contact me.

Thanks,

Best regards,
Iftekhhar

I'm working remotely. The best way to reach me is by email or Microsoft Teams.

Iftekhhar Ahmad | he/him/his
Planner, Environmental Assessment (acting) | Credit Valley Conservation
905-670-1615 ext 296
iftekhhar.ahmad@cvc.ca | cvc.ca



Subject: Re: CVC Comments (Draft PFR) - EA 21/012 - Cooksville Creek Erosion Control at Camilla Road - Draft Project File Submission

Date: Monday, February 26, 2024 at 1:00:26 PM Central Standard Time

From: Adam Nespolo

To: Ahmad, Iftekhar

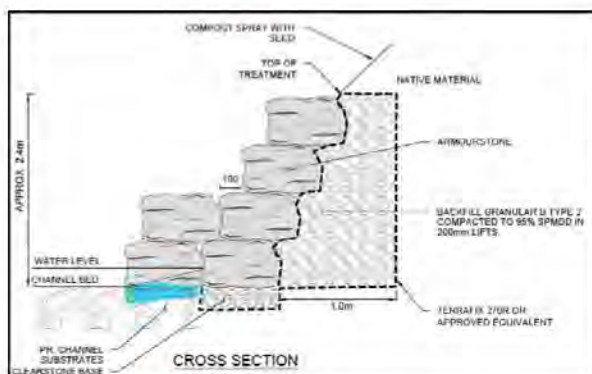
CC: Anthony DiGiandomenico, Ezza Ali, Mark Bassingthwaite, Jennifer Whittard

Attachments: image.png, 20230905 Hydraulic Memo.pdf, Outlook-A diagram .png, Outlook-CVC logo, .png

Hi Iftekhar,

Thank you for the comments. Responses are below. As most comments will be addressed during the design phase, we will be proceeding with filing the final project file.

1. From our experience, armourstone that is not keyed into the channel bed can be undercut leading to the failure of the armourstone wall. It is recommended that all first tier armourstone be keyed into the channel bed. - **We agree with this and this will be incorporated into the design drawings.**



2. In the hydraulic analysis memo, the date on the professional engineers seal (August 28, 2023) must match the date of the memo (August 29, 2023). Please remove this discrepancy and provide the updated memo for our records. - **Memo with revised stamp date is attached, no updates to the memo content were made.**
3. Any grading or ground disturbance within the floodplain that is not included in the proposed works must be returned to the pre-construction conditions at the conclusion of the project. A note should be added to the detailed design drawings. - **Note will be added on the design drawings**
4. Please refer to the Standard Notes for Drawings Submitted for CVC Review and apply the notes to the ESC drawings, as necessary, at the detailed design stage. - **Notes will be added on the design drawings**
5. Any trees removed as a result of the proposed works are to be offset in accordance with CVC's Ecosystem Offsetting Guidelines, Table 3

(attached). Ideally, the replacement trees should be included in the restoration plans and all plantings should be accommodated on the site.
- Replacement trees shall be included in the restoration plans and accommodated onsite where feasible due to space constraints. This will be addressed and discussed further with CVC through the detailed design process.

6. Please refer to CVC's Buffer Enhancement Guideline (attached) for guidance on densities, species, and planting configurations for the restoration plans at the detailed design stage. - Guidelines will be followed when developing the restoration plans.
7. Please also refer to CVC's Plant Selection Guideline (attached) and Healthy Soils Guideline (attached) for preparing the restoration plans at the detailed design stage. - Guidelines will be followed when developing the restoration plans.

We look forward to working further with CVC through the detailed design process.

Thanks,

Adam Nespolo, P.Eng., PMP
Project Engineer, Associate
PO Box 643, Whitby, ON L1N 5V3
anespolo@resilientconsulting.ca
519-993-1931
www.resilientconsulting.ca

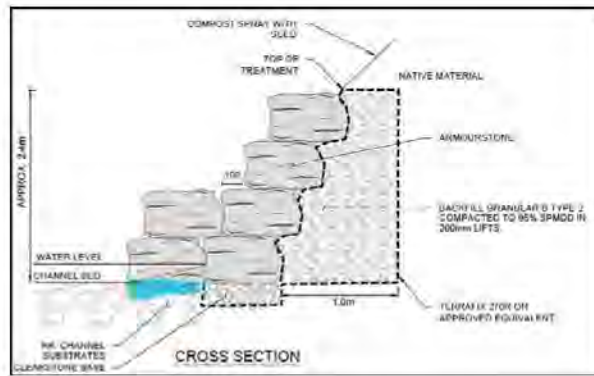
From: Ahmad, Iftekhhar <Iftekhhar.Ahmad@cvc.ca>
Sent: Friday, January 19, 2024 4:33 PM
To: Adam Nespolo <anespolo@resilientconsulting.ca>
Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Ezza Ali <eali@resilientconsulting.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>; Jennifer Whittard <jwhittard@resilientconsulting.ca>
Subject: CVC Comments (Draft PFR) - EA 21/012 - Cooksville Creek Erosion Control at Camilla Road - Draft Project File Submission

Hi Adam,

CVC staff have now had the opportunity to review the current submission including draft PFR (December 2023), responses to our last comments, concept drawings (May 2023), hydraulic analysis memo (August 29, 2023), and floodplain mapping (May 2023), and provide these comments for your consideration.

CVC Comments

8. From our experience, armourstone that is not keyed into the channel bed can be undercut leading to the failure of the armourstone wall. It is recommended that all first tier armourstone be keyed into the channel bed.



9. In the hydraulic analysis memo, the date on the professional engineers seal (August 28, 2023) must match the date of the memo (August 29, 2023). Please remove this discrepancy and provide the updated memo for our records.
10. Any grading or ground disturbance within the floodplain that is not included in the proposed works must be returned to the pre-construction conditions at the conclusion of the project. A note should be added to the detailed design drawings.
11. Please refer to the Standard Notes for Drawings Submitted for CVC Review and apply the notes to the ESC drawings, as necessary, at the detailed design stage.
12. Any trees removed as a result of the proposed works are to be offset in accordance with CVC's Ecosystem Offsetting Guidelines, Table 3 (attached). Ideally, the replacement trees should be included in the restoration plans and all plantings should be accommodated on the site.
13. Please refer to CVC's Buffer Enhancement Guideline (attached) for guidance on densities, species, and planting configurations for the restoration plans at the detailed design stage.
14. Please also refer to CVC's Plant Selection Guideline (attached) and Healthy Soils Guideline (attached) for preparing the restoration plans at the detailed design stage.

If you have any questions, please contact me.

Thanks, have a nice weekend.

Best regards,
Iftekhar

Iftekhar Ahmad | MES | he/him/his
Planner, Environmental Assessment | Planning and Development Services | Credit Valley Conservation

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Date: Thursday, October 28, 2021 at 3:52:25 PM

From: FPP.CA / PPP.CA (DFO/MPO)

To: Jennifer Whittard

CC: Anthony DiGiandomenico, Mark Bassingthwaite

Hello Jennifer,

Thank you for the notification of The Cooksville Creek Erosion Control Project. The Department reviews projects (works, undertakings, or activities) being conducted in or near waterbodies that support fish. We also review project proposals for impacts to Species at Risk. We do not review notifications for administrative processes. Please visit our website at: <https://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html> to determine whether your project requires a review by the Department. If you determine that your project needs a review please complete and submit a Request for Review Form to: FisheriesProtection@dfo-mpo.gc.ca. If you have any questions feel free to contact us at: 1-855-852-8320.

Yours sincerely,

Triage and Planning

Fish and Fish Habitat Protection Program
Fisheries and Oceans Canada

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Sent: Thursday, October 28, 2021 1:32 PM

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project

website at: <http://www.mississauga.ca/cooksvillemillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Date: Thursday, April 21, 2022 at 11:40:33 AM

From: ONT Environment / Environnement ONT

To: Jennifer Whittard

CC: Anthony DiGiandomenico, Mark Bassingthwaite

UNCLASSIFIED / NON CLASSIFIÉ

Greetings,

Thank you for your correspondence.

Please note Transport Canada **does not** require receipt of all individual or Class EA related notifications. We are requesting project proponents self-assess if their project:

1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at www.tbs-sct.gc.ca/dfrp-rbif/; and
2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at <http://www.tc.gc.ca/eng/acts-regulations/menu.htm>.

Projects that will occur on federal property prior to exercising a power, performing a function or duty in relation to that project, will be subject to a determination of the likelihood of significant adverse environmental effects, per Section 82 of the *Impact Assessment Act, 2019*.

If the aforementioned does not apply, the Environmental Assessment program should not be included in any further correspondence and future notifications will not receive a response. If there is a role under the program, correspondence should be forwarded *electronically* to: EnviroOnt@tc.gc.ca with a **brief description of Transport Canada's expected role**.

*Below is a summary of the most common Acts that have applied to projects in an Environmental Assessment context:

- **Canadian Navigable Waters Act (CNWA)** – the Act applies primarily to works constructed or placed in, on, over, under, through, or across navigable waters set out under the Act. The Navigation Protection Program administers the CNWA through the review and authorization of works affecting navigable waters. Information about the Program, CNWA and approval process is available at: <http://www.tc.gc.ca/eng/programs-621.html>. Enquiries can be directed to NPPONT-PPNONT@tc.gc.ca or by calling (519) 383-1863.
- **Railway Safety Act (RSA)** – the Act provides the regulatory framework for railway safety, security, and some of the environmental impacts of railway operations in Canada. The Rail Safety Program develops and enforces regulations, rules, standards and procedures governing safe railway operations. Additional information about the Program is available at: <https://www.tc.gc.ca/eng/railsafety/menu.htm>. Enquiries can be directed to RailSafety@tc.gc.ca or by calling (613) 998-2985.
- **Transportation of Dangerous Goods Act (TDGA)** – the transportation of dangerous

goods by air, marine, rail and road is regulated under the TDGA. Transport Canada, based on risks, develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods to promote public safety. Additional information about the transportation of dangerous goods is available at:

<https://www.tc.gc.ca/eng/tdg/safety-menu.htm>. Enquiries can be directed to TMDOntario@tc.gc.ca or by calling (416) 973-1868.

Aeronautics Act – Transport Canada has sole jurisdiction over aeronautics, which includes aerodromes and all related buildings or services used for aviation purposes. Aviation safety in Canada is regulated under this Act and the Canadian Aviation Regulations (CARs). Elevated Structures, such as wind turbines and communication towers, would be examples of projects that must be assessed for lighting and marking requirements in accordance with the CARs. Transport Canada also has an interest in projects that have the potential to cause interference between wildlife and aviation activities. One example would be waste facilities, which may attract birds into commercial and recreational flight paths. The *Land Use In The Vicinity of Aerodromes* publication recommends guidelines for and uses in the vicinity of aerodromes, available at: <https://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm>. Enquires can be directed to tc.aviationservicesont-servicesaviationont.tc@tc.gc.ca or by calling 1 (800) 305-2059 / (416) 952-0230.

Please advise if additional information is needed.

Thank you,

Environmental Assessment Program, Ontario Region
Transport Canada / Government of Canada / 4900 Yonge St., Toronto, ON M2N 6A5
EnviroOnt@tc.gc.ca / Facsimile : (416) 952-0514 / TTY: 1-888-675-6863

Programme d'évaluation environnementale, Région de l'Ontario
Transports Canada / Gouvernement du Canada / 4900, rue Yonge, Toronto, ON, M2N 6A5
EnviroOnt@tc.gc.ca / télécopieur: (416) 952-0514

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>
Sent: Wednesday, April 13, 2022 9:09 AM
Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>
Subject: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further details and are now available for review and comment at:

<http://www.mississauga.ca/cooksvillemillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Date: Tuesday, November 2, 2021 at 3:52:07 PM

From: Indigenous Consultations Autochtones

To: Jennifer Whittard

CC: Anthony DiGiandomenico, Mark Bassingthwaite

Hello,

Thank you for your email. Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has developed a web-based geographic information system, the Aboriginal and Treaty Rights Information System (ATRIS), which is intended to help users identify the location of Indigenous groups and providing users with information pertaining to each group's established or asserted rights. ATRIS provides access to narrative records, documents and maps that can be used to assist governments, industry and other interested parties in determining their consultation obligations and in carrying out their consultation research. I invite you to visit the ATRIS web page at: <https://www.rcaanc-cirnac.gc.ca/eng/1100100014686/1609421785838>.

As per web pages above, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) regularly holds free webinars to provide an overview of ATRIS and its key functions.

If you require additional information about ATRIS or if you require more specific consultation information related to your project, please contact the Consultation and Accommodation Unit at indigenous.consultations.autochtones@canada.ca.

Vienna Watt *she/they - elle/ielle*

Single Window – Consultation and Accommodation Unit

Guichet unique – L'Unité de la consultation et de l'accommodement

For more information on federal coordination, processes and tools for consultation and accommodation with Indigenous peoples :

Pour de plus amples renseignements sur la coordination, les processus et les outils du gouvernement fédéral pour la consultation et l'accommodement des peuples autochtones : Indigenous.consultations.autochtones@rcaanc-cirnac.gc.ca

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Sent: Thursday, October 28, 2021 10:32 AM

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

Date: Wednesday, April 13, 2022 at 7:15:14PM

From: Indigenous Consultations Autochtones

To: Jennifer Whittard

CC: Anthony.DiGiandomenico@mississauga.ca, Mark Bassingthwaite

Thank you for your correspondence. Are there specific questions you have for us related to this project? Generally, we encourage consultation practitioners to visit the Aboriginal and Treaty Rights Information System (ATRIS) to begin their research regarding who they may consult with. ATRIS is a web-based, geographic information system intended to help users identify the location of Indigenous groups and providing users with information pertaining to each group's established or asserted rights. ATRIS provides access to narrative records, documents and maps that can be used to assist governments, industry and other interested parties in determining their consultation obligations and in carrying out their consultation research. I invite you to visit the ATRIS web page at: <https://www.rcaanc-cirnac.gc.ca/eng/1100100014686/1609421785838>. We regularly host free webinars to provide an overview of ATRIS and its key functions.

If you require additional information about ATRIS or if you require more specific consultation information related to your project, please contact the Consultation and Accommodation Unit at indigenous.consultations.autochtones@rcaanc-cirnac.gc.ca.

Vienna Watt *she/they - elle/ielle*

Single Window – Consultation and Accommodation Unit

Guichet unique – L'Unité de la consultation et de l'accommodement

For more information on federal coordination, processes and tools for consultation and accommodation with Indigenous peoples :

Pour de plus amples renseignements sur la coordination, les processus et les outils du gouvernement fédéral pour la consultation et l'accommodement des peuples autochtones : Indigenous.consultations.autochtones@canada.ca

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Sent: Wednesday, April 13, 2022 9:09 AM

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road - Notice of Online PIC

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further

Subject: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA
Date: Tuesday, November 2, 2021 at 12:32:20 PM
From: Bell, Trevor (MECP)
To: Anthony DiGiandomenico
CC: Potter, Katy (MECP), Wild, Loralyn (MECP), Mark Bassingthwaite, Jennifer Whittard
Attachments: MECP Response Letter_Notice of Commencement_Cooksville Creek Erosion Control Project at Camilla Road.pdf

Good afternoon,

Please find attached a letter from the Ministry of the Environment, Conservation and Parks, Environmental Approvals Branch, regarding the above mentioned project. Feel free to contact me directly with any questions or concerns you may have.

Sincerely,

Trevor Bell | Regional Environmental Planner
Project Review Unit, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
5775 Yonge Street, 8th floor, Toronto ON, M2M 4J1
New Phone: 437-770-3731 | trevor.bell@ontario.ca

Ministry of the Environment,
Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la
Protection de la nature et des Parcs

*Direction des évaluations
environnementales*

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Télec. : 416 314-8452



November 2, 2021

Anthony Di Giandomenico, P. Eng.
Project Manager
City of Mississauga
anthony.digiandomenico@mississauga.ca

BY EMAIL ONLY

Re: **Cooksville Creek Erosion Control Project at Camilla Road
City of Mississauga
Schedule B Municipal Class Environmental Assessment
Notice of Study Commencement**

Dear Mr. Di Giandomenico,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the study is following the approved environmental planning process for a Schedule B project under the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA).

The attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please identify the areas of interest which are applicable to the project and ensure they are addressed. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project, **the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown's preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Mississaugas of the Credit First Nation;
- Six Nations of the Grand River;
- Haudenosaunee Confederacy Chiefs Council; and
- Huron-Wendat Nation (if there is potential for the project to impact archeological resources).

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "[Code of Practice for Consultation in Ontario's Environmental Assessment Process](#)".

Additional information related to Ontario's *Environmental Assessment Act* is available online at: www.ontario.ca/environmentalassessments

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.

The proponent must contact the Director of Environmental Assessment Branch under the following circumstances after initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
- Consultation with Indigenous communities or other stakeholders has reached an impasse; or
- A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights.

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

Once the report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the Proponent.

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister Jeff Yurek
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Please note the project cannot proceed until at least 30 days after the end of the public review period provided for in the Notice of Completion.

Further, the project may not proceed after this time if:

- a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights; or
- the Director has issued a Notice of Proposed Order regarding the project.

The public can request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent.

Once the requested information has been received, the Minister will have 30 days to make a decision or impose conditions on your project.

A draft copy of the report should be sent to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.

Please also ensure a copy of the final notice is sent to the ministry's Central Region EA notification email account (eanotification.cregion@ontario.ca) after the report is finalized.

Should you or your project team members have any questions regarding the material above, please contact me at trevor.bell@ontario.ca.

Sincerely,



Trevor Bell
Regional Environmental Planner

cc: Loralyn Wild, Manager (A), Halton Peel District Office, MECP
Katy Potter, Supervisor (A), Project Review Unit, MECP
Mark Bassingthwaite, Consultant Project Manager, Resilient Consulting Corp.
Jennifer Whittard, Senior Environmental Planner, Resilient Consulting Corp.

Attachments: Areas of Interest
A Proponent's Introduction to the Delegation of Procedural Aspects of
consultation with Aboriginal Communities

AREAS OF INTEREST

It is suggested that you check off each applicable area after you have considered / addressed it.

✓ Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

✓ Planning and Policy

- Ontario has released "A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019)" which replaces the "Growth Plan for the Greater Golden Horseshoe (2017)". More information, including the Plan, is found here: <https://www.placestogrow.ca>.
- Parts of the study area may be subject to the [A Place to Grow: Growth Plan for the Greater Golden Horseshoe \(2019\)](#), [Oak Ridges Moraine Conservation Plan \(2017\)](#), [Niagara Escarpment Plan \(2017\)](#), [Greenbelt Plan \(2017\)](#) or [Lake Simcoe Protection Plan \(2014\)](#). Applicable policies should be referenced in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
- The [Provincial Policy Statement \(2020\)](#) contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

✓ Source Water Protection (all projects)

The *Clean Water Act, 2006 (CWA)* aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the

Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

- o The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.
- o If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.
- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.
- In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: <http://www.applications.ene.gov.on.ca/swp/en/index.php>. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.
- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

✓ **Climate Change**

Ontario is leading the fight against climate change through the [Climate Change Action Plan](#). Recently released, the plan lays out the specific actions Ontario will take in the next five years to meet its 2020 greenhouse gas reduction targets and establishes the framework necessary to meet its long-term targets. As a commitment of the action plan, **the province has now finalized a guide, "[Considering Climate Change in the Environmental Assessment Process](#)" (Guide).**

The Guide is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. **Proponents should review this Guide in detail.**

- The MECP expects proponents to:
 1. Consider during the assessment of alternative solutions and alternative designs, the following:
 - a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
 - b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
 2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature, and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "[Community Emissions Reduction Planning: A Guide for Municipalities](#)" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

✓ **Air Quality, Dust and Noise**

- If there are sensitive receptors in the surrounding area of this project, an air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**
- **If a full Air Quality Impact Assessment is not required for the project, the report should still contain:**
 - o A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
 - o A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
 - o A discussion of local air quality impacts that could arise from this project during both construction and operation; and
 - o A discussion of potential mitigation measures.
- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.
- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to [Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities](#), report prepared for Environment Canada, March 2005.
- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

✓ Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.
- All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
 - Areas of Natural and Scientific Interest (ANSIs)
 - Rare Species of flora or fauna
 - Watercourses
 - Wetlands
 - Woodlots

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, you may consider the provisions of the Rouge Park Management Plan if applicable.

✓ Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.
- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's [Stormwater Management Planning and Design Manual \(2003\)](#) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:
 - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
 - Watershed information, drainage conditions, and other relevant background information
 - Future drainage conditions, stormwater management options, information on erosion and

- sediment control during construction, and other details of the proposed works
 - Information on maintenance and monitoring commitments.
- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.
- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

✓ Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.
- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.
- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.
- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information.

✓ Contaminated Soils

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, 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. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites.
- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.
- The report should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

✓ **Excess Materials Management**

- Activities involving the management of excess soil should be completed in accordance with the MECP's current guidance document titled "[Management of Excess Soil – A Guide for Best Management Practices](#)" (2014).
- All waste generated during construction must be disposed of in accordance with ministry requirements

✓ **Servicing and Facilities**

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with the Environmental Approvals Access and Service Integration Branch (EAASIB) to determine whether a new or amended ECA will be required for any proposed infrastructure.
- We recommend referring to the ministry's [environmental land use planning guides](#) to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

✓ **Mitigation and Monitoring**

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.
- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.
- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

✓ **Consultation**

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the SR that identifies concerns that were raised and

describes how they have been addressed by the proponent throughout the planning process. The Class EA also directs proponents to include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments.

✓ Class EA Process

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.
- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. The Master Plan should clearly indicate the selected approach for conducting the plan, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Section 16 Order requests under the *Environmental Assessment Act*, although the plan itself would not be.
- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout the planning process. The Class EA also directs proponents to include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments.
- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment. The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.
- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations, ECAs, and Species at Risk permits, Conservation Authority permits, and approvals under the *Impact Assessment Act*, 2019.
- Ministry guidelines and other information related to the issues above are available at <http://www.ontario.ca/environment-and-energy/environment-and-energy>. We encourage you to review all the available guides and to reference any relevant information in the report.

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

Definitions

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. Purpose

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. Why is it Necessary to Consult with Aboriginal Communities?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. The Crown's Role and Responsibilities in the Delegated Consultation Process

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;
- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. The Proponent's Role and Responsibilities in the Delegated Consultation Process

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;

- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;
- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. What are the Roles and Responsibilities of Aboriginal Communities' in the Consultation Process?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant documentation;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. What if More Than One Provincial Crown Ministry is Involved in Approving a Proponent's Project?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA
Date: Tuesday, February 6, 2024 at 12:56:33 PM Central Standard Time
From: Liu, Chunmei (MECP)
To: Jennifer Whittard
CC: Battarino, Gavin (MECP), Wild, Loralyn (She/Her) (MECP), EA Notices to CRegion (MECP), Panko, Dan (MECP)

Good afternoon, Jennifer, hope you're doing well 😊

Thank you for following up with us regarding this project. The ministry has no comments at this time and may not consider reviewing this project if your project team consider no significant concerns identified by the public and stakeholders, or those concerns can be addressed through further detailed design stage and permit and approval process(es).

If you have any questions regarding our approach for this project, please feel free to contact us for further discussion.

Many thanks,

Chunmei Liu (she/her) | Regional Environmental Planner

Environmental Assessments Branch, Ontario Ministry of the Environment, Conservation and Parks | 7th Flr, 135 St Clair Ave W, Toronto, ON M4V 1P5 | Chunmei.Liu@ontario.ca | 437-249-3102

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Sent: February 6, 2024 12:14 PM

To: Wild, Lorilyn (She/Her) (MECP) <Loralyn.Wild@ontario.ca>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Lorilyn – I just received bounce backs from both Trevor and Katy regarding the email trail below. Are you able to tell me if the MECP will be providing comments on the draft Project File? Or is there someone else we should be in touch with?

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Tuesday, February 6, 2024 at 11:11 AM

To: Bell, Trevor (MECP) <Trevor.Bell@ontario.ca>

Cc: Potter, Katy (MECP) <Katy.Potter@ontario.ca>, Wild, Lorilyn (MECP) <Loralyn.Wild@ontario.ca>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA

Hi Trevor – I am checking in regarding my email below. Will the MECP be providing comments on the draft Project File?

Thanks,
Jen

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Wednesday, December 20, 2023 at 1:48 PM

To: Bell, Trevor (MECP) <Trevor.Bell@ontario.ca>

Cc: Potter, Katy (MECP) <Katy.Potter@ontario.ca>, Wild, Lorilyn (MECP) <Loralyn.Wild@ontario.ca>, Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>, Adam Nespolo <anespolo@resilientconsulting.ca>, Ezza Ali <eali@resilientconsulting.ca>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA

Hi Trevor,

On behalf of the City of Mississauga, please find attached for MECP's review and comment, a copy of the draft Project File for the City's Cooksville Creek Erosion Control Project at Camilla Road. Pending the receipt comments, we intend to finalize the report and publish the Notice of Completion in early 2024.

We would appreciate your confirmation of receipt.

Thanks and happy holidays,
Jen

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

From: Bell, Trevor (MECP) <Trevor.Bell@ontario.ca>

Date: Tuesday, November 2, 2021 at 12:32 PM

To: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>

Cc: Potter, Katy (MECP) <Katy.Potter@ontario.ca>, Wild, Loralyn (MECP)

<Loralyn.Wild@ontario.ca>, Mark Bassingthwaite

<mbassingthwaite@resilientconsulting.ca>, Jennifer Whittard

<jwhittard@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road - Schedule B Municipal Class EA

Good afternoon,

Please find attached a letter from the Ministry of the Environment, Conservation and Parks, Environmental Approvals Branch, regarding the above mentioned project. Feel free to contact me directly with any questions or concerns you may have.

Sincerely,

Trevor Bell | Regional Environmental Planner

Project Review Unit - Environmental Assessment Branch

Ministry of the Environment, Conservation and Parks

1000 Highway 7 East, 3rd Floor, Toronto, ON, M1B 4Y1

New Phone: 437-770-3731 | trevor.bell@ontario.ca

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road
Municipal Class EA - Notice of Study Commencement

Date: Tuesday, November 2, 2021 at 10:13:30 AM

From: Land ROW East

To: Jennifer Whittard

CC: Anthony DiGiandomenico, Mark Bassingthwaite

Attachments: image001.png, image002.png, image003.png, Cooksville Creek
EA_Notice of Commencement.pdf

Good afternoon,

Thank you for contacting Trans-Northern Pipeline Inc regarding the Erosion Control Project.

TNPI currently operates a high-pressure petroleum products transmission pipeline within the Cooksville Creek and would like to be aware of any future planning and design of this project.

Kind regards,

Renée Flowerday

Property and Right of Way Administrator/ Administrateur de propriété et de droit de passage

Trans-Northern Pipelines Inc. | 45 Vogell Road, Suite 310, Richmond Hill, ON L4B 3P6 |

landroweast@tnpi.ca



Trans-Northern // Trans-Nord

Make it Home!!



From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Sent: October 28, 2021 1:32 PM

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

CAUTION: This email originated from outside of the TNPI organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while

also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project website at: <http://www.mississauga.ca/cooksvillecamillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp



Hydro One Networks Inc
483 Bay St
Toronto, ON

November 03, 2021

Re: Cooksville Creek Erosion Control Project at Camilla Road

Attention:

Anthony DiGiandomenico, P.Eng.

Project Manager

City of Mississauga.

Thank you for sending us notification regarding (Cooksville Creek Erosion Control Project at Camilla Road). In our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information.

If plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure.

Any future communications are sent to Secondarylanduse@hydroone.com.

Be advised that any changes to lot grading and/or drainage within proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

Sent on behalf of,

Secondary Land Use

Asset Optimization

Strategy & Integrated Planning

Hydro One Networks Inc.

Indigenous Community Communications

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement
Date: Friday, November 5, 2021 at 11:35:03 AM
From: Jennifer Whittard
To: Caron.Smith@mncfn.ca
CC: Communications@mncfn.ca, Anthony DiGiandomenico, Mark Bassingthwaite

Attachments: Cooksville Creek EA_Notice of Commencement.pdf

Hi Caron,

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project website at: <http://www.mississauga.ca/cooksvillemcamillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
www.resilientconsulting.ca
@resilientccorp

March 8, 2022

VIA EMAIL

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting

Dear Jennifer Whittard

RE: MCFN Response to

Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Confirmation of Receipt

I am writing on behalf of the Mississaugas of the Credit First Nation ("MCFN") to acknowledge that we have received your above named communication, dated November 5, 2021 .

Outline of MCFN Rights and Territory

In 1806 , the Crown and MCFN entered into Head of the Lake Treaty, No. 14 (1806) regarding the lands in which your project is situated.

The Mississaugas of the Credit First Nation are the descendants of the "River Credit" Mississaugas. The undisputed Territory of the MCFN is defined as a Territory commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, northward along the shore of the Lake to the River Rouge east of Toronto then up that river to the dividing ridges to the head waters of the River Thames then southward to Long Point, the place of the beginning. Our Territory encompasses the lands and waters that were used and occupied by our Ancestors. Territories are usually large tracts of land that reflect the breadth required for seasonal activities and habitation and changes in those movement patterns through time. Through Treaties with the Crown, MCFN agreed to share our Territory with newcomers. However, not all of MCFN's Territory has been dealt with through a Treaty.



With the exception of a small part of the Credit River, our Treaties with the Crown did not deal with the water parts of our Territory. We have not agreed to share any part of our waters with settlers. We formally gave notice to the Crown of this claim in 2016. We note that any lands that have been artificially created on our waters have also not been dealt with by any Treaty.

Like our ancestors before us, we continue to use the lands, waters, and watershed ecosystems within our Territory for a variety of livelihood, harvesting, ceremonial and spiritual purposes. We have always exercised governance functions and stewardship in order to protect our Territory, conserve the fish and wildlife that depend upon it, and ensure its ongoing ability to sustain our people. We assert that our Aboriginal and treaty rights fundamentally entitle us to continue to act as stewards of our Territory, to be involved in decisions that affect it, and to participate in the ongoing, responsible management of the resources it provides.

Duty to Consult and Accommodate

As you will know, the Crown has a constitutional duty to consult and accommodate MCFN in respect of any decisions that might affect its asserted or proven Aboriginal and/or Treaty Rights. We expect that, consistent with the Crown's constitutional duty, no approval should be issued to this project until MCFN has been sufficiently consulted and accommodated. Nothing in this letter shall be construed as to affect our Aboriginal and/or Treaty Rights and hence shall not limit any consultation and accommodation owed to MCFN by the Crown or any proponent, as recognized by section 35 of the Constitution Act, 1982.

MCFN has the right to free and informed consent prior to the approval of any project or any planning decision adversely impacting its Territory and to benefit economically from resource development within its Territory.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. It is DOCA's mandate to ensure that we are directly involved in all planning and development that impacts the integrity of our Territory. In this regard, DOCA will assess and help alleviate impacts on our rights, land claims, and ways of life by building relationships with governments and private sector proponents. We share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.



DEPARTMENT OF CONSULTATION AND ACCOMMODATION

Mississaugas of the Credit First Nation
4065 Hwy #6, Hagersville, Ontario NOA 1H0



Phone: (905) 768-4260



MCFN is not opposed to development, but MCFN must to be involved in development decision making. MCFN has a deep connection to its Territory and we have a stewardship responsibility for our land. By engaging with us, a project proponent can learn our perspective on how to care for this land and we can work together to shape the project to mitigate damaging effects to our land and perhaps even work to improve our environment. MCFN is the only party who shall determine whether there are impacts to our Aboriginal and treaty rights.

One of the ways we require proponents to engage with us is in providing transparency during the environmental survey and archaeological assessment process. The best way to accomplish this is by having Field Liaison Representatives (“FLRs”) on location while fieldwork is occurring, who can ensure that the Nation’s special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN’s territory and heritage and it is our responsibility to ensure their protection, on behalf of the Nation. MCFN’s stewardship of its territory extends through the life of any development project and beyond.

In the spirit of collaboration and relationship building, MCFN encourages the City of Mississauga to consider use of MCFN owned businesses in the execution of this project. For further information please contact Christopher Lefebvre, Mississaugas of the Credit Business Corporation.

DOCA Project Registration

DOCA has completed an initial intake review of the project communication you have provided. This file has been assigned DOCA Project 2021-1080 ; please use this number in all future communications.

We respectfully ask you to immediately notify us if there are any changes to the project.

Referral to DOCA Units

Following DOCA’s initial intake review of the project communication, the file has been referred to the following DOCA Units for additional follow-up.

	Unit Identification	Primary Contact	Email Address
✓	Archaeology	Adam LaForme	adam.laforme@mncfn.ca
	Cultural/Historical	Darin Wybenga	darin.wybenga@mncfn.ca
✓	Environment	Mark LaForme	mark.laforme@mncfn.ca
✓	FLR Participation	Adam LaForme	adam.laforme@mncfn.ca
	Governance	Katelyn LaForme	katelyn.laforme@mncfn.ca
	Economic Development	Christopher Lefebvre	clefebvre@mncbc.ca

If you have not been contacted by the indicated DOCA Units within fourteen days following receipt of this letter, please let me know.



DEPARTMENT OF CONSULTATION AND ACCOMMODATION

Mississaugas of the Credit First Nation
4065 Hwy #6, Hagersville, Ontario NOA 1H0



Phone: (905) 768-4260



Request for Missing Information

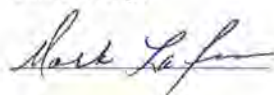
In order to proceed with our follow-up review, we ask you to ensure that all available information relating to the project has been transmitted to us. We have identified the following general information as missing from your initial project communication:

Outstanding Project Information	
✓	Name of person or body undertaking the action or decision.
✓	Contact information for the person or body undertaking the action or decision.
✓	List of documents pertaining to the proposed action/decision that are available for MCFN to review.
✓	Description of what other information is expected to become available before the proposed action/decision is undertaken.
✓	Deadlines or filing dates pertaining to the action/decision.
✓	The Crown or Municipal review/ approval that is required for the project.
✓	How the proposed action or decision may affect and/or benefit MCFN, its rights and territory.

Closing

We ask that you respond with the above requested information within fourteen days following receipt of this letter. We thank you in advance for your attention to our requirements and we look forward to working with you further to shape the planning for development in our Territory.

Sincerely,



Mark LaForme
Director

mark.laforme@mncfn.ca



Subject: RE: DOCA Project 2021-1080, Response to Your Request for Information
Date: Thursday, April 28, 2022 at 2:43:31 PM
From: Marie-Annick Prevost
To: Jennifer Whittard
CC: Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo, Adam LaForme
Attachments: image001.png

Aanii Jen,

On behalf of the Mississauga of the Credit First Nation, Department of Consultation and Accommodation, I read the Stage 1 Archaeological Assessment report prepared by ASI for the Cooksville creek at Camila road project.

I have no question or comment about the archaeological work conducted. MCFN currently agrees with the recommendations of the report.

We look forward to working together on the upcoming Stage 2 assessments. When field-work planning commences, please contact our Archaeological Operations Supervisor Adam LaForme to coordinate Field Liaison Representative participation and subsequent report review.

Miigwetch,

Marie-Annick Prevost, PhD (she/her)
Field archaeologist



Mississaugas of the Credit First Nation (MCFN)
Department of Consultation and Accommodation (DOCA)
4065 Highway 6 North, Hagersville, ON N0A 1H0
Cell: 905-870-5844

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>
Sent: Thursday, April 7, 2022 12:06 PM
To: DOCA <DOCA@mncfn.ca>; Mark LaForme <Mark.LaForme@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>; Adam Nespolo <anespolo@resilientconsulting.ca>
Subject: DOCA Project 2021-1080, Response to Your Request for Information

Good afternoon Mark, Adam & Rojin,

Thank you for your response (attached) to our Notice of Study Commencement. Provided below **in bold** and attached is the information you requested. Note especially #3 regarding Stage 2 archaeological investigations.

1. Name of person or body undertaking the action or decision:
City of Mississauga, City's Project Manager: Anthony DiGiandomenico
2. Contact information for the person or body undertaking the action or decision:
anthony.digiandomenico@mississauga.ca, (905) 615-3200 ext. 3491
3. List of documents pertaining to the proposed action/decision that are available for MCFN to review:
Attached for your review is the Stage 1 Archaeological Assessment. A small part of the study area was found to exhibit archaeological potential (see Figure 13 at the end of the report) and Stage 2 archaeological investigations are anticipated sometime in Spring 2022. Another Indigenous community has already agreed to be involved in this work. Please let us know if/how you would also like to be involved.
4. Description of what other information is expected to become available before the proposed action/decision is undertaken:
An Online Public Information Centre (PIC) is planned from April 13 to May 4, 2022. You will receive the Notice of Online PIC via email. In summary, the preliminary preferred solution includes replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road. Details will be made available on the City's project website at: <http://www.mississauga.ca/cooksvillemcamillastudy>.
5. Deadlines or filing dates pertaining to the action/decision:
Filing of the Class Environmental Assessment (EA) is currently anticipated in Q3/Q4, 2022.
6. The Crown or Municipal review/approval that is required for the project:
Provided there are no concerns with the Class EA, various permits, approvals or authorizations will be required prior to construction, including, for example, from the Region of Peel, Credit Valley Conservation (CVC), Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), and the Department of Fisheries and Oceans Canada (DFO). Additional requirements may be identified as the project proceeds.
7. How the proposed action or decision may affect and/or benefit MCFN, its rights and territory:
No impacts or benefits to MCFN are currently anticipated.

Please accept my apologies for the delay in getting back to you, and please do let me know if you wish to be involved in the Stage 2 archaeological investigations. You will hear from me again next week regarding the Online PIC.

Thanks,
Jen

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca

@resilientccorp

From: DOCA <DOCA@mncfn.ca>

Date: Tuesday, March 8, 2022 at 1:54 PM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: Adam LaForme <Adam.LaForme@mncfn.ca>, Mark LaForme <Mark.LaForme@mncfn.ca>

Subject: MCFN Response to Cooksville Creek Erosion Control Project at Camilla Road

Good afternoon Jennifer,

Please see the attached letter response to your November 5, 2021 notification regarding Cooksville Creek Erosion Control Project at Camilla Road – Municipal Class EA.

I have cc'd the appropriate MCFN departments as outlined in the letter. Please provide MCFN with the requested info in the letter attached and a link to the appropriate documents.

Please note this e-mail does not constitute consultation with the Mississaugas of the Credit First Nation as required by the Crown when making decisions that may adversely impact Aboriginal and treaty rights.

MCFN looks forward to working with you on this project.

Sincerely,

Rojin Amani (Shared Value Solutions) on behalf of Darin Wybenga

Subject: DOCA Project 2021-1080 - Notice of Online PIC
Date: Wednesday, April 13, 2022 at 10:16:05 AM
From: Jennifer Whittard
To: DOCA@mncfn.ca, Mark.LaForme@mncfn.ca,
Adam.LaForme@mncfn.ca
CC: Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo
Attachments: Notice of Online PIC - Cooksville Creek EA.pdf

Good morning Mark, Adam & Rojin,

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road (DOCA Project 2021-1080).

As I mentioned in my email last week, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further details and are now available for review and comment at: <http://www.mississauga.ca/cooksvillecamillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

Also note that the **Stage 2 archaeological investigations have now been tentatively scheduled for May 30, 2022. Please let us know if you wish to be involved.**

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
Senior Environmental Planner
Resilient Consulting
PO Box 643
Whitby, ON L1N 5V3
www.resilientconsulting.ca
@resilientccorp

Subject: RE: PIF Notification - Williams - Cooksville Creek (21EA-238)
Date: Wednesday, June 15, 2022 at 10:45:54 AM

From: Blake Williams
To: Adrian Blake
CC: Adam LaForme, Archaeology (MHSTCI), Adam Nespolo, Jennifer Whittard

Attachments: image002.gif, image003.jpg, RE- DOCA Project 2021-1080 - Notice of Online PIC.eml

Hi Adrian,

Engagement was initiated for this project and an agreement was signed for this project with the City of Mississauga. The signed paperwork was sent over on June 2, 2022, and the assigned DOCA number was 2021-1080. Stage 2 fieldwork was completed, without finding any archaeological resources, on June 6, 2021. We were expecting an FLR to join us on site, however, no one arrived onsite.

Please see the attached email showing the latest discussion between Adam LaForme, Resilient Consulting, and the City.

Let me know if you have any questions.

Blake Williams (He/him), **MLitt**
Lead Archaeologist | Project Manager • Environmental Assessment Division



ASI • Providing Archaeological & Cultural Heritage Services
BWilliams@asiheritage.ca • 416 966 1069 x 258 • Fax: 416 966 9723
528 Bathurst Street, Toronto, Ontario, M5S 2P9 • asiheritage.ca

From: Adrian Blake <Adrian.Blake@mncfn.ca>
Sent: June 14, 2022 3:34 PM
To: Blake Williams <bwilliams@asiheritage.ca>
Cc: Adam LaForme <Adam.LaForme@mncfn.ca>; Archaeology (MHSTCI) <archaeology@ontario.ca>
Subject: PIF Notification - Williams - Cooksville Creek (21EA-238)

Good afternoon,

We are pleased to send you the attached letter regarding your upcoming archaeological assessment on Mississaugas of the Credit First Nation Treaty Territory.

Regards,
Adrian Blake, MSc. (he/him)
Field Archaeologist



Department of Consultation and Accommodation (DOCA)

Mississaugas of the Credit First Nation (MCFN)

4065 Highway 6 North, Hagersville, ON N0A 1H0

M: 905-979-3862

<http://www.mncfn.ca>

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Subject: RE: Report review for Cooksville Creek Stage 2 (DOCA Number 2021-1080)

Date: Friday, September 2, 2022 at 9:52:47 AM

From: Marie-Annick Prevost

To: Blake Williams

CC: Adam Nespolo, Jennifer Whittard, Adam LaForme

Attachments: image002.png, image003.gif

Aanii Blake,

On behalf of the Mississaugas of the Credit First Nation, Department of Consultation and Accommodation, I reviewed the Stage 2 Archaeological Assessment report prepared by ASI for the Cooksville Creek erosion control project.

We appreciate that Hannah and their crew did their due diligence and dug more than 1m to confirm deep disturbance.

I do not have questions or comments about the archaeological work conducted or the content of the report.

We look forward to collaborating with you on future projects.

Miigwech,

Marie-Annick Prevost, Ph.D. (she/her)
Field archaeologist



Mississaugas of the Credit First Nation (MCFN)
Department of Consultation and Accommodation (DOCA)
4065 Highway 6 North, Hagersville, ON N0A 1H0
Cell: 905-870-5844

From: Blake Williams <bwilliams@asiheritage.ca>

Sent: Friday, August 26, 2022 3:53 PM

To: Adam LaForme <Adam.LaForme@mncfn.ca>

Cc: Adam Nespolo <anespolo@resilientconsulting.ca>; Jennifer Whittard <jwhittard@resilientconsulting.ca>

Subject: Report review for Cooksville Creek Stage 2 (DOCA Number 2021-1080)

Hi Adam,

The City of Mississauga finished their review of the Cooksville Creek report and it is ready for

your review. The DOCA number for this project is 2021-1080.

If possible, could you please provide your feedback by September 23rd? Please let me know if more time is required.

Cheers,

Blake Williams (He/him), **MLitt**

Lead Archaeologist | Project Manager • Environmental Assessment Division



ASI • Providing Archaeological & Cultural Heritage Services

BWilliams@asiheritage.ca • 416 966 1069 x 258 • Fax: 416 966 9723

528 Bathurst Street, Toronto, Ontario, M5S 2P9 • asiheritage.ca

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road
Municipal Class EA - Notice of Study Commencement

Date: Thursday, April 14, 2022 at 10:50:20 AM

From: Marie-Sophie Gendron

To: Jennifer Whittard, Dominic Ste-Marie

CC: Lori-Jeanne Bolduc, Jean-Francois Richard, Isabelle Lechasseur,
Anthony DiGiandomenico, Mark Bassingthwaite, Adam Nespolo,
Alexandra Daigle

Attachments: image001.jpg

Good morning Jennifer,

I hope this email finds you doing well. We revised the Stage 1 AA send earlier this year for the Cooksville Creek Erosion Control Project at Camilla Road. Our team took the time to read the report and we do not have any comments to add or any concerns.

We wish to be contacted once the Stage 2 AA is schedule to participate in the fieldwork.

Tiawenhk inenh chia' entio'!

Marie-Sophie



NATION HURONNE-WENDAT
Bureau du Nionwentsio

Marie-Sophie Gendron, B.A.
Analyste archéologue

255, Place Chef Michel-Laveau
Wendake (Qc) G0A 4V0
Téléphone : 418-843-3767
Courriel : marie-sophie.gendron@wendake.ca



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De : Jennifer Whittard <jwhittard@resilientconsulting.ca>

Envoyé : 15 février 2022 11:31

À : Dominic Ste-Marie <Dominic.Sainte-Marie@wendake.ca>

Cc : Lori-Jeanne Bolduc <Lori-Jeanne.Bolduc@wendake.ca>; Jean-Francois Richard <Jean-Francois.Richard@wendake.ca>; Isabelle Lechasseur <Isabelle.Lechasseur@wendake.ca>; Marie-Sophie Gendron <Marie-Sophie.Gendron@wendake.ca>; Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite

<mbassingthwaite@resilientconsulting.ca>; Adam Nespolo <anespolo@resilientconsulting.ca>

Objet : Re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Hi Dominic,

Further to the email trail below, please find attached the Stage 1 Archaeological Assessment as requested.

A small part of the study area was found to exhibit archaeological potential (see Figure 13 at the end of the report) and Stage 2 investigations have been recommended. Please let us know how you would like to be involved in this work and further details regarding your funding requirements.

Thanks,
Jen

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Thursday, November 11, 2021 at 3:14 PM

To: Dominic Ste-Marie <Dominic.Sainte-Marie@wendake.ca>

Cc: Lori-Jeanne Bolduc <Lori-Jeanne.Bolduc@wendake.ca>, Jean-Francois Richard <Jean-Francois.Richard@wendake.ca>, Isabelle Lechasseur <Isabelle.Lechasseur@wendake.ca>, Marie-Sophie Gendron <Marie-Sophie.Gendron@wendake.ca>, Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Hi Dominic,

Thank you for your reply. We will share the draft Stage 1 Archaeological Assessment report with you when it is completed. If Stage 2 works are recommended, we will be sure to arrange for your participation in that fieldwork.

In addition to the Stage 1 report, we will continue to notify you of formal opportunities for input. In the meantime however, please feel free to reach out at any time if you require additional information or would like to share additional information with us.

Thanks,
Jen

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
www.resilientconsulting.ca
@resilientccorp

From: Dominic Ste-Marie <Dominic.Sainte-Marie@wendake.ca>

Date: Tuesday, November 9, 2021 at 10:37 AM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: Lori-Jeanne Bolduc <Lori-Jeanne.Bolduc@wendake.ca>, Jean-Francois Richard <Jean-Francois.Richard@wendake.ca>, Isabelle Lechasseur <Isabelle.Lechasseur@wendake.ca>, Marie-Sophie Gendron <Marie-Sophie.Gendron@wendake.ca>

Subject: RE: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Kwe Jennifer,

Thank you for your email. The Huron-Wendat Nation wishes to be consulted for this project. We are also interested in participating in all archaeological fieldwork for this project, as well as receiving copies of the draft reports for review and comments. Funding must be made available to insure our participation.

Tiawenhk chia' önenh
Dominic Ste-Marie

ATTENTION: Please note that Maxime Picard has a new position at the Huron-Wendat Nation Council and is no longer in charge of Ontario consultations. Any new consultation from Ontario must be sent to Mario Gros-Louis (mario.gros-louis@wendake.ca), Lori-Jeanne Bolduc (lori-jeanne.bolduc@wendake.ca) and Dominic Ste-Marie (dominic.ste-marie@wendake.ca).

For inquiries relating specifically to archaeology (fieldwork planning, monitoring, reports review, etc.), please contact Marie-Sophie Gendron (marie-sophie.gendron@wendake.ca), Isabelle Lechasseur (isabelle.lechasseur@wendake.ca) and Jean-François Richard (jean-francois.richard@wendake.ca).

De : Jennifer Whittard <jwhittard@resilientconsulting.ca>

Envoyé : 5 novembre 2021 13:37

À : Mario Gros Louis <Mario.GrosLouis@wendake.ca>; Louis Lesage <Louis.Lesage@wendake.ca>; melanievincent21@yahoo.ca

Cc : Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>; Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Objet : Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project website at: <http://www.mississauga.ca/cooksvillecamillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
www.resilientconsulting.ca
@resilientccorp

Subject: Report review for Cooksville Creek Stage 2
Date: Friday, August 26, 2022 at 2:52:35 PM

From: Blake Williams
To: Marie-Sophie Gendron
CC: Isabelle Lechasseur, Jean-Francois Richard, Adam Nespolo, Jennifer Whittard

Attachments: image001.gif, 21EA238_Stg 2 AA_2022-Jul_27.pdf

Bonjour Marie-Sophie!

The City of Mississauga finished their review of the Cooksville Creek report and it is ready for your review.

If possible, could you please provide your feedback by September 23rd? Please let me know if more time is required.

Cheers,

Blake Williams (He/him), **MLitt**
Lead Archaeologist | Project Manager • Environmental Assessment Division



ASI • Providing Archaeological & Cultural Heritage Services
BWilliams@asiheritage.ca • 416 966 1069 x 258 • Fax: 416 966 9723
528 Bathurst Street, Toronto, Ontario, M5S 2P9 • asiheritage.ca

Subject: Re: Call re: Cooksville Creek Erosion Control Project at Camilla Road
Municipal Class EA, Mississauga

Date: Wednesday, June 1, 2022 at 1:44:36 PM

From: Sharann Martin

To: Jennifer Whittard

CC: Todd Williams, olgreene@hotmail.com, bwilliams@asiheritage.ca, Adam
Nespolo, Mark Bassingthwaite

Hi Jennifer,

Todd Williams will be sending our agreement along shortly - I apologize for the delay. We are planning on sending someone out for June 6th and I'll be able to send along the name and phone number closer to the date.

Thank you,
Sharann

On Wed, Jun 1, 2022 at 2:05 PM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

Hi Sharann/Todd,

Further to the email trail below, I've not yet received your agreement for the Stage 2 works next Monday, June 6th. Were you or a representative still planning to attend?

If so, the crew is planning to meet at the Husky Gas station parking lot at 155 N Service Rd, Mississauga at 8 AM. The Field Director will be Jacob Roberts and his cell phone is [REDACTED]. We would appreciate if you could **please let us know the name of your representative and provide a cell phone number in case there is an issue or emergency**. In the meantime, if you have any questions, please contact Blake Williams, ASI (copied).

Thanks,

Jen

Jennifer Whittard, BES, M.Plan., PMP

Senior Environmental Planner

Resilient Consulting

PO Box 643

Whitby, ON L1N 5V3

www.resilientconsulting.ca

@resilientccorp

From: Sharann Martin <sharann.martin@gmail.com>

Date: Thursday, May 19, 2022 at 12:53 PM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: Todd Williams <williams.todde@gmail.com>, olgreene@hotmail.com
<olgreene@hotmail.com>

Subject: Re: Call re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA, Mississauga

Hi Jennifer,

Yes, that would work for us - I've noted the change. I'll keep an eye out for deployment information and please let us know if there are any other changes.

Thank you,

Sharann

On Thu, May 19, 2022 at 1:05 PM Jennifer Whittard <jwhittard@resilientconsulting.ca> wrote:

Hi Sharann,

I've just heard that the Stage 2 archaeological assessment is being postponed due to a couple of issues outside of our control. We are still waiting on confirmation from the land owner, but does a new date of Monday, June 6th work for you?

Thanks,

Jen

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Monday, May 16, 2022 at 2:56 PM

To: Sharann Martin <sharann.martin@gmail.com>

Cc: Todd Williams <williams.todde@gmail.com>, olgreene@hotmail.com
<olgreene@hotmail.com>

Subject: Re: Call re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA, Mississauga

Hi Sharann,

Attached is a map that shows the planned location of the Stage 2 assessment. Other than being planned for Monday, May 30th, I don't have any other information at the moment. I will be sure to pass along additional details (i.e., meeting time) this week or next.

I will coordinate with the City regarding your agreement as soon as I receive it!

Thanks,

Jen

Jennifer Whittard, BES, M.Plan., PMP

Senior Environmental Planner

Resilient Consulting

PO Box 643

Whitby, ON L1N 5V3

www.resilientconsulting.ca

@resilientccorp

From: Sharann Martin <sharann.martin@gmail.com>
Date: Monday, May 16, 2022 at 2:00 PM
To: Jennifer Whittard <jwhittard@resilientconsulting.ca>
Cc: Todd Williams <williams.todde@gmail.com>, Owen Greene <olgreene@hotmail.com>
Subject: Re: Call re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA, Mississauga

Good afternoon Jennifer,

I'm following up on the Stage 2 archaeological assessments being planned at 2081 Camilla Road, Mississauga. We are interested in meaningfully participating in the assessment. I've cc'ed Todd Williams on this email and he will be sending our standard monitoring agreement shortly.

I see you've attached the Stage 1 report, thank you. If you could forward any other relevant communication and deployment information regarding this assessment to me and cc Todd Williams and Owen Greene, that would be great.

I look forward to hearing from you soon.

Thank you,

Sharann Martin

On Wed, May 11, 2022 at 3:59 PM Janice Williams <janicewilliams@hdi.land> wrote:

Sge:no,

I had a meeting this morning with Jennifer Whittard. She asked if HDI would be interested in being involved with a stage 2 test pitting (tentatively being held on May 30). She has asked if you could forward agreement with the city of Mississauga.

I told her I would get someone from the Arch team to confirm with her about HDI involvement.

Hao,

Raechelle Williams
HDI Environmental Supervisor
Haudenosaunee Development Institute
16 Sunrise Court, Suite 402B Ohsweken, ON
P.O. Box 714
Ph: 519-445-4222
(Direct): 519-802-9402



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From: **Jennifer Whittard** <jwhittard@resilientconsulting.ca>
Date: Tue, May 10, 2022 at 7:19 AM
Subject: Call re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA, Mississauga
To: Janice Williams <janicewilliams@hdi.land>
Cc: traceyghdi@gmail.com <traceyghdi@gmail.com>, williams.todde@gmail.com <williams.todde@gmail.com>, Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Hi Raechelle,

I'm following up regarding the email trail below. Please let me know when I should give you a call or set up a virtual meeting.

In the meantime, I wanted to let you know that **Stage 2 archaeological investigations are planned at 2081 Camilla Road, Mississauga on Monday, May 30th** (see attached map). Representatives from both the Mississaugas of the Credit First Nation and the Huronne-Wendat Nation will be joining our archeologist on site. Please let us know if you also wish to be involved.

Also attached is the Stage 1 Archaeological Assessment report for further context.

Thanks,

Jen

Jennifer Whittard, BES, M.Plan., PMP

Senior Environmental Planner

Resilient Consulting

PO Box 643

Whitby, ON L1N 5V3

www.resilientconsulting.ca

@resilientccorp

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Friday, April 29, 2022 at 10:56 AM

To: Janice Williams <janicewilliams@hdi.land>

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Hi Raechelle,

I just left you a message. I have an out-of-country cell number, so if you'd like, I can give you a call back another time or I can send you a meeting link via either Zoom or Microsoft Teams. Just let me know what you'd prefer and when.

Thanks so much,

Jen

From: Janice Williams <janicewilliams@hdi.land>

Date: Tuesday, April 19, 2022 at 9:31 AM

To: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Cc: Anthony.DiGiandomenico@mississauga.ca

<Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite
<mbassingthwaite@resilientconsulting.ca>, Todd Williams
<williams.todde@gmail.com>, Tracey General <traceyghdi@gmail.com>

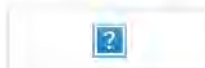
Subject: Fwd: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

Hello Jennifer,

This is Raechelle Williams from HDI Environmental Team. I was hoping you could give me a call to talk more about this project and the status. Mind you our conversation does not constitute consultation, engagement and/or consent on the Cooksville Creek Erosion Control Project. My number is (519) 802 - 9402.

Nya:weh,

Raechelle Williams
HDI Environmental Supervisor
Haudenosaunee Development Institute
16 Sunrise Court, Suite 402B Ohsweken, ON
P.O. Box 714
Ph: 519-445-4222
(Direct): 519-802-9402



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From: **Tracey General** <info@hdi.land>

Date: Wed, Apr 13, 2022 at 11:05 AM

Subject: Fwd: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

To: <ganowa@me.com>, <aarondetlor@gmail.com>, <williams.todde@gmail.com>, Janice Williams <janicewilliams@hdi.land>, Kahsenniyo Williams <kahsenniyowilliams@gmail.com>

----- Forwarded message -----

From: **Jennifer Whittard** <jwhittard@resilientconsulting.ca>

Date: Wed, Apr 13, 2022 at 11:28 AM

Subject: Re: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

To: info@hdi.land <info@hdi.land>

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre** (PIC) for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further details and are now available for review and comment at: <http://www.mississauga.ca/cooksvillecamillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP

Senior Environmental Planner

Resilient Consulting

PO Box 643

Whitby, ON L1N 5V3

www.resilientconsulting.ca

@resilientccorp

From: Jennifer Whittard <jwhittard@resilientconsulting.ca>

Date: Friday, November 5, 2021 at 11:38 AM

To: hdi2@bellnet.ca <hdi2@bellnet.ca>

Cc: Anthony DiGiandomenico <Anthony.DiGiandomenico@mississauga.ca>, Mark Bassingthwaite <mbassingthwaite@resilientconsulting.ca>

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project website at: <http://www.mississauga.ca/cooksvillecamillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP

Senior Environmental Planner

Resilient Consulting

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Study Commencement
Date: Friday, November 5, 2021 at 11:38:07 AM
From: Jennifer Whittard
To: markhill@sixnations.ca
CC: Anthony DiGiandomenico, Mark Bassingthwaite
Attachments: Cooksville Creek EA_Notice of Commencement.pdf

Good afternoon Chief Hill,

On behalf of the City of Mississauga, please find attached the Notice of Study Commencement for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being undertaken as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the study commencement and invite your preliminary input, as applicable.

This section of Cooksville Creek at Camilla Road spans 200 metres, and consists of an engineered channel constructed approximately 30 to 40 years ago with areas of stone-filled gabion basket walls and concrete-lined channel. Through the City's ongoing erosion monitoring program, this section of the creek has been identified as requiring rehabilitation. The study will identify and evaluate a range of design options to ensure long-term stability of the creek, while also protecting or enhancing the existing natural environment within the study area.

If you have any initial comments, require further information, or would like to be removed from the study mailing list, please let us know by way of reply to this email or by contacting one of the Study Team members listed in the notice. Additional information is available on the project website at: <http://www.mississauga.ca/cooksvillecamillastudy>.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan, PMP
Senior Environmental Planner
Resilient Consulting
www.resilientconsulting.ca
@resilientccorp

Subject: Cooksville Creek Erosion Control Project at Camilla Road Municipal Class EA - Notice of Online PIC

Date: Wednesday, April 13, 2022 at 10:23:07 AM

From: Jennifer Whittard

To: markhill@sixnations.ca

CC: Anthony DiGiandomenico, Mark Bassingthwaite

Attachments: Notice of Online PIC - Cooksville Creek EA.pdf

On behalf of the City of Mississauga, please find attached the **Notice of Online Public Information Centre (PIC)** for the Cooksville Creek Erosion Control Project at Camilla Road. The study is being conducted as a Schedule B Municipal Class Environmental Assessment (EA). The purpose of this notice is to inform you of the preliminary preferred solution and invite your input, as applicable.

The study has identified and evaluated four alternative solutions to address existing erosion issues and provide an opportunity to naturalize the site. Based on the results of the evaluation, the preliminary preferred solution is **replacement of the existing concrete channel with an armourstone-lined channel and channel naturalization west of Camilla Road, and channel cleanup and new bank protection east of Camilla Road**. The PIC materials provide further details and are now available for review and comment at: <http://www.mississauga.ca/cooksvillecamillastudy>.

Pending comments received from the public, Indigenous communities, and various review agencies, completion of the Project File (EA report) is tentatively planned for Fall 2022. You will then receive similar notification that the Project File is available for review. In the meantime, please submit any comments or questions you may have by completing our online Comment Form or by way of reply to this email. We would appreciate **your response by May 4, 2022**. If you require further information, please also feel free to contact one of the study team members listed in the notice.

We look forward to hearing from you.

Thanks,

Jennifer Whittard, BES, M.Plan., PMP
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Whitby, ON L1N 5V3
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Stage 2 Archaeological Assessment Cooksville Creek Erosion Control Project Part of Lot 14, Concession 1 South of Dundas Street (Geographical Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel

Supplementary Documentation: Indigenous Engagement

Prepared for:

Resilient Consulting

PO Box 643, Whitby, Ontario
L1N 5V3

Archaeological Licence: P383 (Williams)

PIF P383-0328-2022

Archaeological Services Inc. File: 21EA-238

27 July 2022



1.0 Project Context

Indigenous community engagement was initiated by Resilient Consulting, on behalf of the City of Mississauga, prior to the start of the Stage 2 assessment for the Cooksville Creek Erosion Control project in the City of Mississauga, Ontario (PIF: P383-0328-2022). Communities were informed that ASI would be undertaking the Stage 2 assessment and would handle the logistical coordination of fieldwork scheduled to begin on June 6, 2022. Upon completion of fieldwork, the draft report was circulated for review. The contacted parties are listed below:

Haudenosaunee Development Institute:

- Janice Bomberry: Janicehdi@gmail.com
- Todd Williams: Williams.todde@gmail.com
- Sharann Martin: Sharann.martin@gmail.com
- Owen Greege: Olgreene@hotmail.com

Mississaugas of the Credit First Nation:

- Fawn Sault: Fawn.sault@mncfn.ca
- Adrian Blake: Adrian.blake@mncfn.ca
- Mariah Sault: Field.coordinator@mncfn.ca
- Adam LaForme: Adam.laforme@mncfn.ca

Nation Huronne-Wendat (Huron-Wendat Nation):

- Marie-Sophie Gendron: Marie-sophie.gendron@wedake.ca
- Mélanie Vincent: Melanievincent21@yahoo.ca
- Valérie Janssen: Valerie.janssen@cnhw.qc.ca
- Jean-Francois Richard: Jean-francois.richard@wendake.ca
- Isabelle Lechasseur: Isabelle.lechasseur@wendake.ca

Six Nations of the Grand River Elected Council:

- Lonny Bomberry: Lonnybomberry@sixnations.ca



- Tanya Hill-Montour: Tanyahill-montour@sixnation.ca
- Dawn LaForme: Dlaforme@sixnations.ca

2.0 Record of Engagement

Resilient Consulting received positive responses from the Haudenosaunee Development Institute and the Mississaugas of the Credit First Nation indicating their interest in participation during Stage 2 fieldwork. The Huron-Wendat Nation noted their interest in participation, however, no subsequent communication was received. No communication was received from the Six Nations of the Grand River Elected Council.

The Stage 2 test pit survey for the Cooksville Creek Erosion Control project was conducted under the field direction of Hannah Curtis (R1296) on June 6, 2022, in accordance with the *Ontario Heritage Act* and the *Standards and Guidelines for Consultant Archaeologists, Section 2* (MTC, 2011). During the execution of the test pit survey, John Powless from Haudenosaunee Development Institute (HDI), was on-site monitoring and providing input on the assessment. No Field Liaison Representatives from the Mississaugas of the Credit First Nation or the Huron-Wendat Nation joined ASI onsite.

No concerns were expressed during the execution of the test pit survey. The results of this assessment and a copy of the final report were shared with the communities to keep all parties updated and informed (ASI, 2022).

Table 2 below provides a record of all communications and comments received from Indigenous communities throughout the draft report review process.



Table 1: Record of Communications

Date	Method of Communication	Community	Summary
April 7 and 13, 2022	Email	Haudenosaunee Development Institute, Mississaugas of the Credit First Nation, Huron-Wendat Nation and Six Nations of the Grand River	Resilient Consulting initiated Indigenous Engagement and project details as part of the Notice of Online Public Information Centre were shared.
April 18, 2022	Email	Haudenosaunee Development Institute, Mississaugas of the Credit First Nation and Huron-Wendat Nation	Preliminary fieldwork date provided, and MCFN note their interest.
June 14, 2022	Email	Mississaugas of the Credit First Nation	Adrian Blake requested further information. ASI provided the information as requested and notified Adrian that an agreement was signed by MCFN and the City of Mississauga and ASI was expecting a representative onsite.

Date	Method of Communication	Community	Summary
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3.0 Bibliography and Sources

- ASI, (Archaeological Services Inc. (2022). Stage 2 Archaeological Assessment Cooksville Creek Erosion Control Project Part of Lot 14, Concession 1 South of Dundas Street (Geographical Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel (PIF: P383-0328-2022).
- MTC, (Ministry of Tourism and Culture). (2011). Standards and Guidelines for Consultant Archaeologists. Cultural Programs Branch, Ontario Ministry of Tourism and Culture.

