



Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project

Environmental Report

June 2020 – 19-1850



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Acronyms and Abbreviations

ANSI	Area of Natural and Scientific Interest
CBC	Christmas Bird Count
<i>CEAA, 2012</i>	<i>Canadian Environmental Assessment Act, 2012</i>
CFB	Canadian Forces Base
cSWH	Candidate Significant Wildlife Habitat
cWH	Candidate Wildlife Habitat
DFO	Fisheries and Oceans Canada
Dillon	Dillon Consulting Limited
EA	environmental assessment
EASR	Environmental Activity and Sector Registry
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
Enbridge	Enbridge Gas Inc.
EPP	Environmental Protection Plan
ER	Environmental Report
ha	hectare(s)
HVA	Highly Vulnerable Aquifer
IP	intermediate pressure
IPZ	Intake Protection Zone
km	kilometre(s)
L/day	litres per day

LIO	Land Information Ontario
LTC	Leave-to-Construct
m	metre(s)
masl	metres above sea level
mbgs	metres below ground surface
MECP	Ontario Ministry of Environment, Conservation and Parks
MENDM	Ontario Ministry of Energy, Northern Development and Mines
MHSTCI	Ontario Ministry of Heritage, Sport, Tourism and Culture Industries
MMAH	Ontario Ministry of Municipal Affairs and Housing
MNR	Ontario Ministry of Natural Resources
MNRF	Ontario Ministry of Natural Resources and Forestry
MTO	Ontario Ministry of Transportation
MWH	Mammals of the Western Hemisphere
NCC	National Capital Commission
NHIC	Natural Heritage Information Centre
Notice	Notice of Study Commencement and Open House
NPS	nominal pipe size
NRCan	Natural Resources Canada
O&M	operations and maintenance
OBA	Ontario Butterfly Atlas
OBBA	Ontario Breeding Bird Atlas
OEB	Ontario Energy Board

OEB Guidelines	<i>Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition</i>
OGS	Ontario Geological Survey
OPCC	Ontario Pipeline Coordinating Committee
O. Reg.	Ontario Regulation
OWRA	<i>Ontario Water Resources Act</i>
PTTW	Permit to Take Water
QP	Qualified Professional
RSC	Revised Statutes of Canada
RSO	Revised Statutes of Ontario
RVCA	Rideau Valley Conservation Authority
SAR	species at risk
SARA	<i>Species at Risk Act</i>
SARO	Species at Risk in Ontario (List)
SC	Statutes of Canada
SCC	Species of Conservation Concern
SO	Statutes of Ontario
SWH	Significant Wildlife Habitat
the Project	approximately 20 km of natural gas pipeline in the City of Ottawa
the Study	environmental and cumulative effects assessment
TMHC	Timmins Martelle Heritage Consultants Inc.
WHPA	Well Head Protection Area
WWIS	Water Well Information System
XHP	extra high pressure

Executive Summary

Enbridge Gas Inc. (Enbridge) retained Dillon Consulting Limited (Dillon) to conduct an environmental and cumulative effects assessment (the Study) for approximately 20 kilometres (km) of natural gas pipeline in the City of Ottawa (the Project). Pending regulatory approval, construction of the Project is anticipated to begin in Q2 2021.

The Project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South.

The Project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 16-inch, 12-inch, 6-inch, and 4-inch XHP steel pipe to replace the existing St. Laurent Pipeline. The pipeline would be installed within existing road rights-of-way, where possible.

The Study results have been documented in this Environmental Report (ER), which conforms to the OEB (2016) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition*.

Stakeholder engagement and Indigenous consultation are an important component of the Project. Early and frequent consultation with directly and indirectly affected Indigenous communities, property owners, government agencies, and the public was an integral part of the Study.

The Study involved undertaking an inventory of physical, natural, and socio-economic features within the Study Area. This information was used to produce maps identifying features that could be impacted by pipeline construction and operation. Enbridge selected Preferred Routes for the Study based on environmental and socio-economic concerns, as well as technical and economic feasibility requirements. The Preferred Routes are mainly sited in existing, previously disturbed municipal road rights-of-way, which greatly reduces potential adverse effects to the surrounding environment.

Mitigation measures are recommended to reduce potential negative effects to the environment. These recommendations, in combination with Enbridge's Construction and Maintenance Manual, are anticipated to effectively protect the physical, natural, and socio-economic features along the Preferred Routes. Dillon does not anticipate any significant adverse effects from the construction and operation of the Project with the implementation of the mitigation measures recommended in this report.

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Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project - Environmental Report

June 2020 – 19-1850



1.0

Introduction

Enbridge Gas Inc. (Enbridge) retained Dillon Consulting Limited (Dillon) to conduct an environmental and cumulative effects assessment (the Study) for approximately 20 kilometres (km) of natural gas pipeline in the City of Ottawa (the Project). Pending regulatory approval, construction of the Project is anticipated to begin in Q2 2021.

1.1

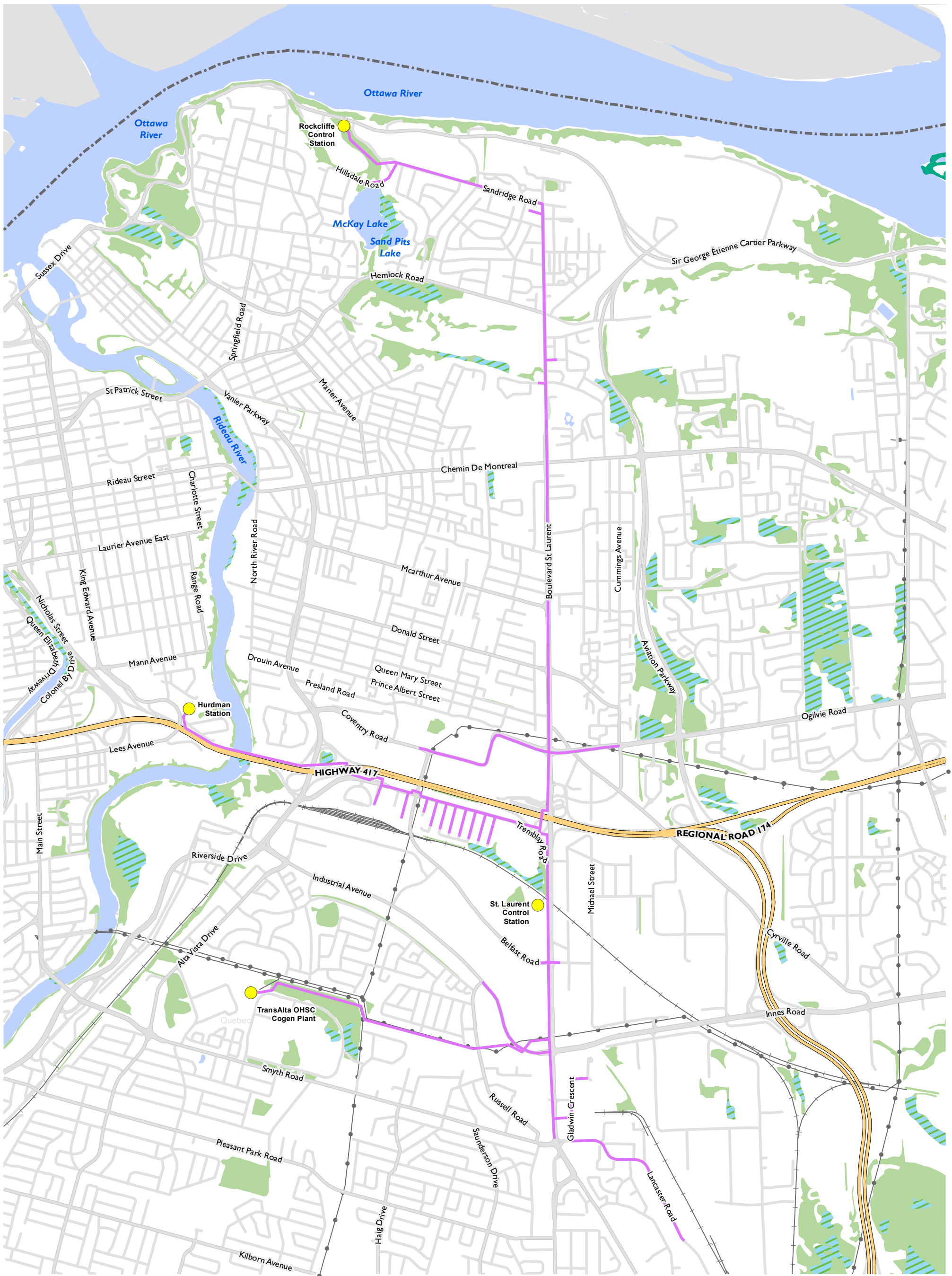
Description of the Project

The Project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South (**Figure 1**).

The Project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route (**Figure 2**). Phase 4 involves installation of new nominal pipe size (NPS) 16-inch, 12-inch, 6-inch, and 4-inch XHP steel pipe to replace the existing St. Laurent Pipeline (**Figure 3**).

The pipeline would be installed within existing road rights-of-way, where possible. Locating the replacement pipeline within existing, previously disturbed municipal road rights-of-way will reduce the potential environmental and socio-economic effects. Typical depth of ground cover over the pipeline will be approximately 0.9 metres (m) to 1.2 m; however, it may be installed deeper to provide additional protection in areas where it crosses underneath existing infrastructure (e.g., roads, sewers, rail lines).

Temporary workspace and laydown areas will be required adjacent to the proposed location of the pipeline to facilitate the movement and storage of equipment necessary for construction. Enbridge will work with the City of Ottawa, regulatory agencies, and landowners to identify and secure appropriate workspace, as required.



ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

**PROJECT OVERVIEW -
EXISTING PIPELINE
FIGURE I**



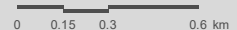
- | | | |
|-------------------|------------------|----------------------------------|
| Station | Base Data | Water Body |
| Existing Pipeline | Highway | Wooded Area |
| | Major Road | Unevaluated Wetland |
| | Local Road | Provincially Significant Wetland |
| | Utility Line | Provincial Boundary |
| | Railway | |



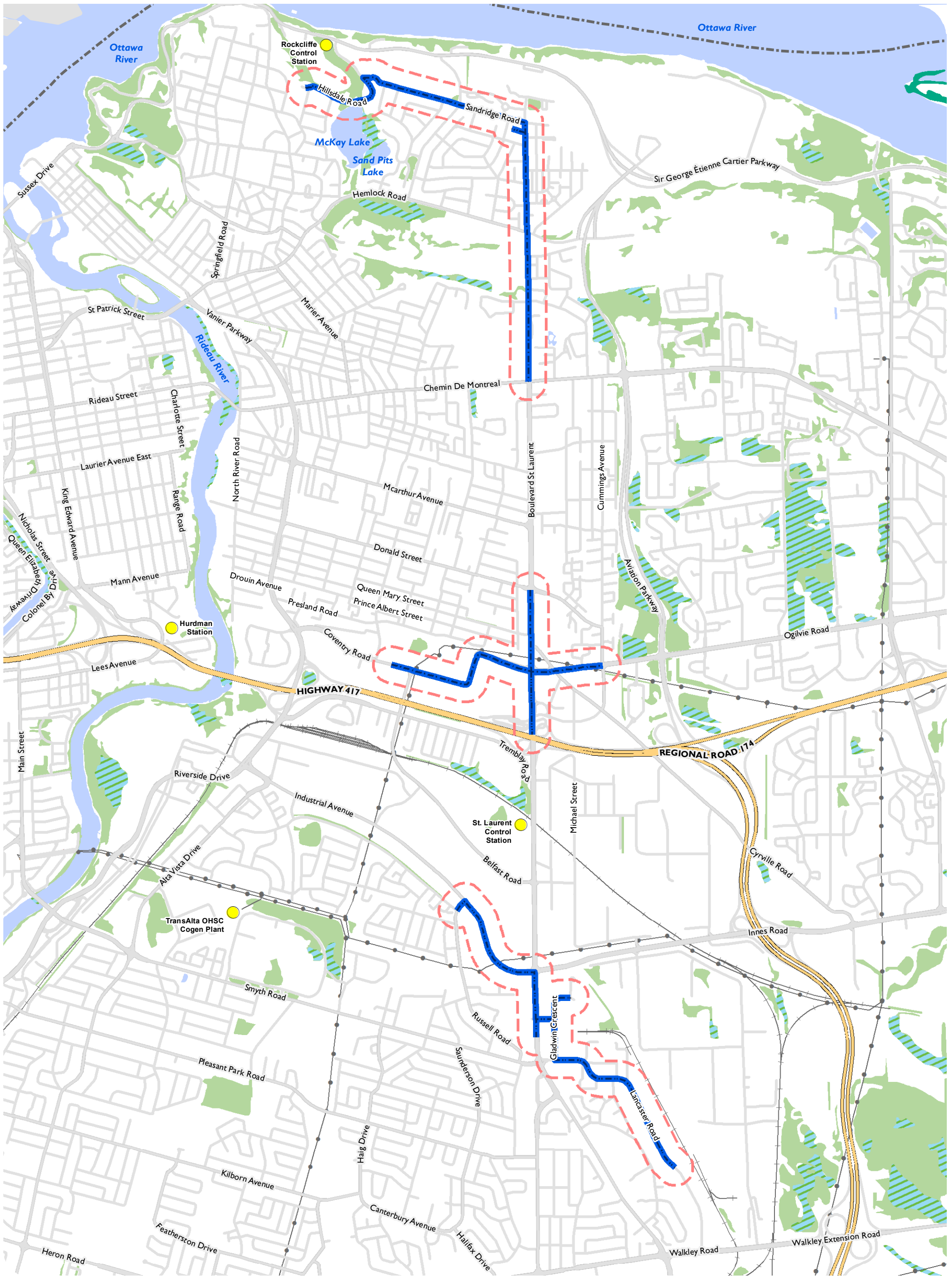
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:25,000



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25



ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

**PROJECT OVERVIEW -
PHASE 3
FIGURE 2**



Station

Proposed Routes

Phase 3 IP Segments

Study Area (125 m)

Gas Line Types

NPS 6 IP Gas Main

NPS 4 IP Gas Main

NPS 2 IP Gas Main

Base Data

Highway

Major Road

Local Road

Utility Line

Railway

Water Body

Wooded Area

Unevaluated Wetland

Provincially Significant Wetland

Provincial Boundary



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; ENBRIDGE GAS INC.

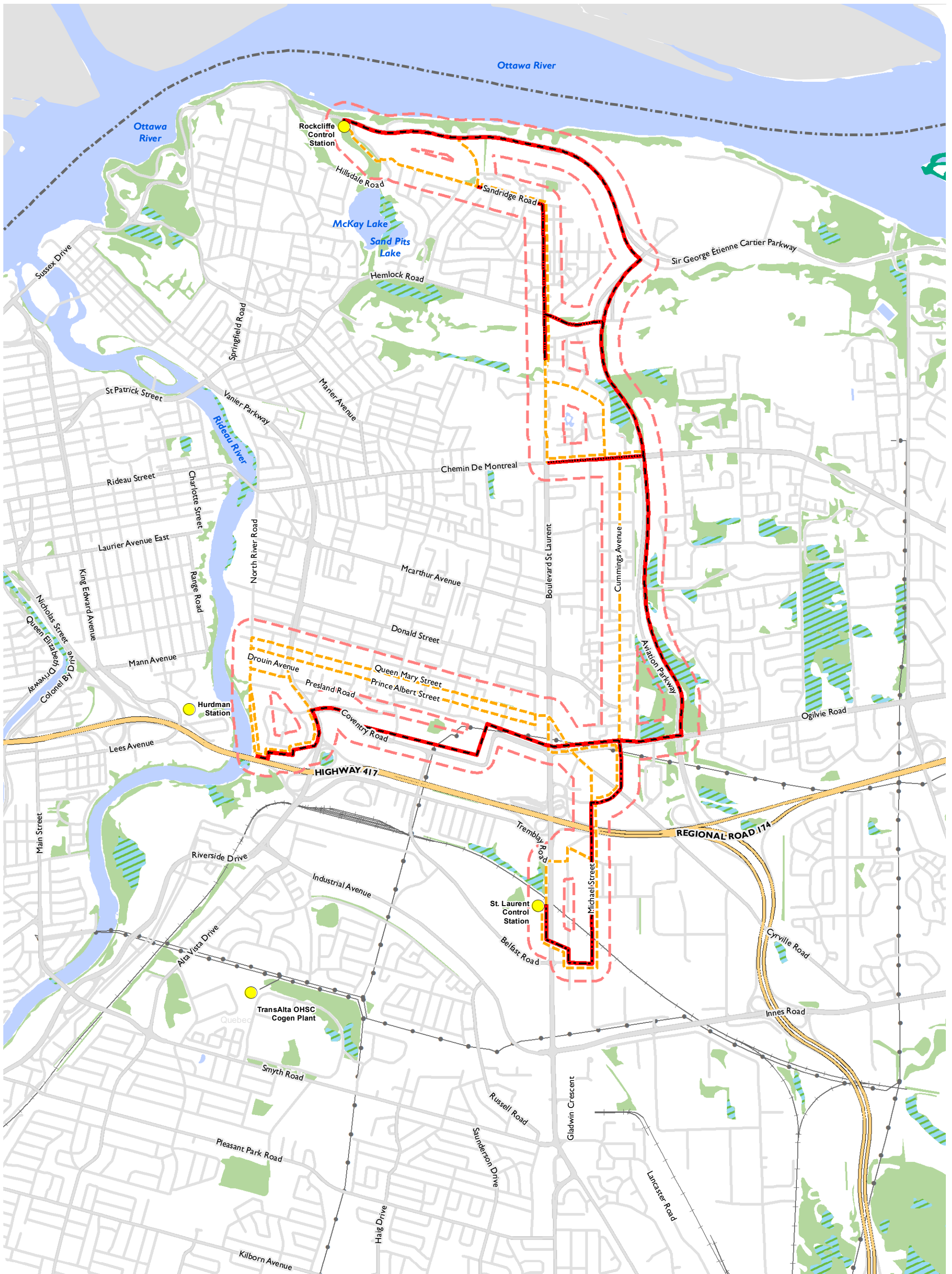
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MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:25,000

0 0.15 0.3 0.6 km



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25



ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

**PROJECT OVERVIEW -
PHASE 4**
FIGURE 3



Station

Study Area (125 m)

Proposed Routes

Phase 4 XHP Preferred Route

XHP Alternative Routes

Gas Line Types

NPS 16 XHP Gas Main

NPS 12 XHP Gas Main

NPS 6 XHP Gas Main

NPS 4 XHP Gas Main

Base Data

Highway

Major Road

Local Road

Utility Line

Railway

Water Body

Wooded Area

Unevaluated Wetland

Provincially Significant Wetland

Provincial Boundary



Note: Routes have been offset for visual purposes.

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:25,000

0 0.15 0.3 0.6 km



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25

1.2 Project Need and Justification

Enbridge identified the need to replace the existing St. Laurent Pipeline through ongoing operations and maintenance (O&M) activities (i.e., inspection and monitoring). The pipeline was originally constructed in four phases in 1958, 1962, 1985, and 1992, and integrity monitoring indicates that the pipeline condition is deteriorating as a result of its age. Enbridge has determined that replacing the pipeline is the best option for maintaining safe and reliable natural gas service to existing customers.

1.3 Environmental and Cumulative Effects Assessment

Dillon conducted a Study to identify potential environmental and socio-economic effects that the Project could have on the existing physical, natural, and socio-economic environment. Mitigation measures designed to reduce environmental and socio-economic effects were also developed as part of the Study. The Study results have been documented in this Environmental Report (ER), which conforms to the OEB (2016) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition* (OEB Guidelines).

1.4 Regulatory Framework

The Study was prepared to meet the requirements of the OEB. More information on the regulatory process is provided in the following subsections.

1.4.1 Ontario Energy Board

The Project is being planned in accordance with OEB regulations. The OEB acts as a regulatory body to protect the public interest, to determine that the Project is necessary, and to ensure that Enbridge obtains the necessary approvals to meet health, safety, and environmental standards and regulations.

For OEB approval, the ER must document that municipal, provincial, and federal agencies, as well as the concerns of Indigenous communities, were considered. Concerns identified by landowners and the public must also be addressed.

Once complete, the ER is circulated to the Ontario Pipeline Coordinating Committee (OPCC). The OPCC coordinates the Ontario government's review of natural gas facility projects that require OEB approval. The OPCC's goal is to reduce adverse environmental effects that could arise from projects by reviewing environmental and routing reports.

If requested, the ER is also circulated to Indigenous communities, landowners adjacent to the project, and to interest groups, such as municipalities and the local conservation authority. Where possible, all outstanding issues are resolved prior to submission of an application to the OEB.

The OEB may order a written or oral hearing, based upon the complexity of the project and the level of public concern. Enbridge plans to file a Leave-to-Construct (LTC)

Application with the OEB in Q3 2020. If approved by the OEB, construction of Phase 3 is anticipated to start in Q2 2021 and construction of Phase 4 is anticipated to start in Q1 2022 with commissioning planned for Q4 2022.

1.4.2 Impact Assessment Agency of Canada

The new federal *Impact Assessment Act* (SC 2019, c. 28, s. 1) came into force on August 28, 2019, repealing the former *Canadian Environmental Assessment Act, 2012 (CEAA, 2012)* (SC 2012, c. 19, s. 52). Under this new legislation, the Impact Assessment Agency of Canada is the single agency responsible for management and coordination of federal impact assessments.

Federal government involvement under the *Impact Assessment Act* (SC 2019, c. 28, s. 1), as with *CEAA, 2012*, is required for specific types of projects. The types of projects that require federal review and approval are listed as “designated projects” in the *Physical Activities Regulations* (SOR/2019-285), or are designated through Ministerial discretion.

The Project is partially located on federal lands administered by the National Capital Commission (NCC) (i.e., lands along Sir George-Étienne Cartier Parkway and Aviation Parkway). The portion of the Project on federal lands is subject to review by a federal authority, pursuant to Section 67 of *CEAA, 2012*. The Project falls under the regulatory requirements of *CEAA, 2012* and not the *Impact Assessment Act*, as consultation with the NCC in regard to the Project was initiated prior to the coming into force of the *Impact Assessment Act* on August 28, 2019. The NCC, in collaboration with Environment and Climate Change Canada (ECCC), have a responsibility to determine whether the Project is likely to cause significant adverse environmental effects. The NCC is responsible, as it is the administrator of the lands, and ECCC is also responsible should a permit under Section 73 of the *Species at Risk Act (SARA)* (SC 2002, c. 29) be required. Based on ongoing engagement with these agencies, it is anticipated that the NCC and ECCC will coordinate their Section 67 responsibilities with regard to the Project.

1.4.3 Other Potential Permits, Approvals, or Notifications

In addition to OEB approval, other regulatory approvals may be required for the Project, as shown in **Table 1**. An appropriate amount of time should be scheduled to obtain all necessary permits and approvals prior to construction.

Table 1: Potential Permits, Approvals, or Notifications

Agency	Legislation	Permit/Approval/Notification
NCC and ECCC	<i>CEAA, 2012</i> (SC 2012, c. 19, s. 52)	Minister's Decision Statement (Approval under Section 67) – Required for Project activities on federal lands.
NCC	<i>National Capital Act</i> (RSC 1985, c. n-4)	Federal Land Use/Land Transaction/Design Approval – Required for Project activities on lands administered by the NCC.
NCC (cont'd)	<i>National Capital Act</i> (RSC 1985, c. n-4)	<p>Land Access Permit(s) – Required for the use of, and access to, NCC lands for Project activities such as biophysical field surveys and construction.</p> <p>Licence of Occupation – Required for the use of NCC lands for a specific period of time, which is longer than that covered by a Land Access Permit, but usually less than 5 years. A Licence of Occupation is issued only after a Federal Land Use/Land Transaction/Design Approval has been granted.</p> <p>Easement – Required for long-term use (i.e., period greater than 5 years) of NCC lands. An Easement is issued only after a Federal Land Use/Land Transaction/Design Approval has been granted.</p>
ECCC	<i>SARA</i> (SC 2002, c. 29)	<p>Section 73 Permit – Required for any activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals. See Section 5.2.7 of this report.</p> <p>Nest sweeps must be conducted a maximum of 7 days prior to vegetation removal during the bird nesting season (i.e., March 15 to August 31; ECCC 2018, Ontario Ministry of Natural Resources [MNR] 2000), in accordance with the <i>Migratory Birds Convention Act, 1994</i> (SC 1994, c. 22).</p>
Ministry of Environment, Conservation and Parks (MECP)	<i>Endangered Species Act, 2007</i> (SO 2007, c. 6) and <i>Ontario Regulation (O. Reg.) 242/08</i>	Approval(s) are required for activities that may affect a provincially-listed Species at Risk (SAR) (Endangered or Threatened) and/or their habitat. See Section 5.2.7 of this report.

Agency	Legislation	Permit/Approval/Notification
		<p>Consultation with MECP is recommended to determine the potential types of approvals that may be required.</p> <p>Permit(s) may be required if the Project requires construction dewatering (groundwater and/or storm water takings) of more than 50,000 litres per day (L/day). For volumes greater than 50,000 L/day but less than 400,000 L/day for the purposes of construction site dewatering, the Project may be eligible for registration under the Environmental Activity and Sector Registry (EASR). A Water Taking Plan must be completed by a Qualified Professional (QP) for registration. If the Project is not eligible under the EASR, a Permit to Take Water (PTTW) will be required. PTTW applications (Category 2 or 3) require a study prepared by a QP, as per the <i>OWRA</i>.</p>
Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	<i>Ontario Heritage Act</i> (RSO 1990, c. O.18)	<p>Archaeological clearance is required prior to any ground disturbances and/ or site alterations. A Stage 1 Archaeological Assessment was completed for the Project and was submitted to the MHSTCI for review on March 19, 2020. A copy of the report is provided Appendix A. A Stage 2 Archaeological Assessment is scheduled to be completed in summer 2020.</p> <p>The Cultural Heritage Checklist completed for the Project is provided in Appendix B. A Cultural Heritage Assessment Report should be completed to determine if a Heritage Impact Assessment is required prior to construction.</p>
Ministry of Transportation (MTO)	<i>Public Transportation and Highway Improvement Act</i> (RSO 1990, c. P.50)	Encroachment Permit(s) – Required for Project works that will occur within the Highway 417 right-of-way corridor, within a 395 m radius around a highway interchange/intersection, or within 45 m of the highway property limit.
Rideau Valley Conservation	<i>Conservation Authorities Act</i> (RSO 1990, c. C.27) and <i>O.</i>	Application for “Development, Interference with Wetlands and Alterations to Shorelines and Watercourses”– Required for Project works that

Agency	Legislation	Permit/Approval/Notification
Authority (RVCA)	<i>Reg. 174/06: Rideau Valley Conservation Authority: Regulation of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses</i>	will occur within the RVCA Regulated Area near a lake, river, stream, floodplain, steep slope, or wetland.
City of Ottawa	Municipal Trees and Natural Areas Protection By-law (No. 2006-279)	Approval from the Director of Surface Operations of the Public Works and Services Department, or authorized designate, is required if Project activities will result in work within the critical root zone of a tree, whether the work is on municipal property or private property.
	Tree Conservation – Urban By-law (No. 2009-200)	A by-law of the City of Ottawa to protect trees on private property in the urban area. An application for a tree permit is required for any person who intends to injure or destroy a tree on land greater than one hectare (ha) in area shall submit to the General Manager an application for a tree permit that includes the information described in subsection (2) of the By-law.
City of Ottawa (cont'd)	Noise By-law (No. 2017-255)	A Noise By-law Exemption from the Director of By-law Services is required if construction noises will occur outside of the allowable hours identified in the By-law.
	Road Activity By-law (No. 2003-445)	A Road Cut Permit is required to undertake road cuts within a public roadway. A road cut is defined in the By-law as a surface or subsurface cut in any part of a public roadway made by any means, including any excavation, reconstruction, cutting, saw cutting, overlaying, crack sealing, breaking, boring, jacking or tunneling operations.

2.0

Study Process

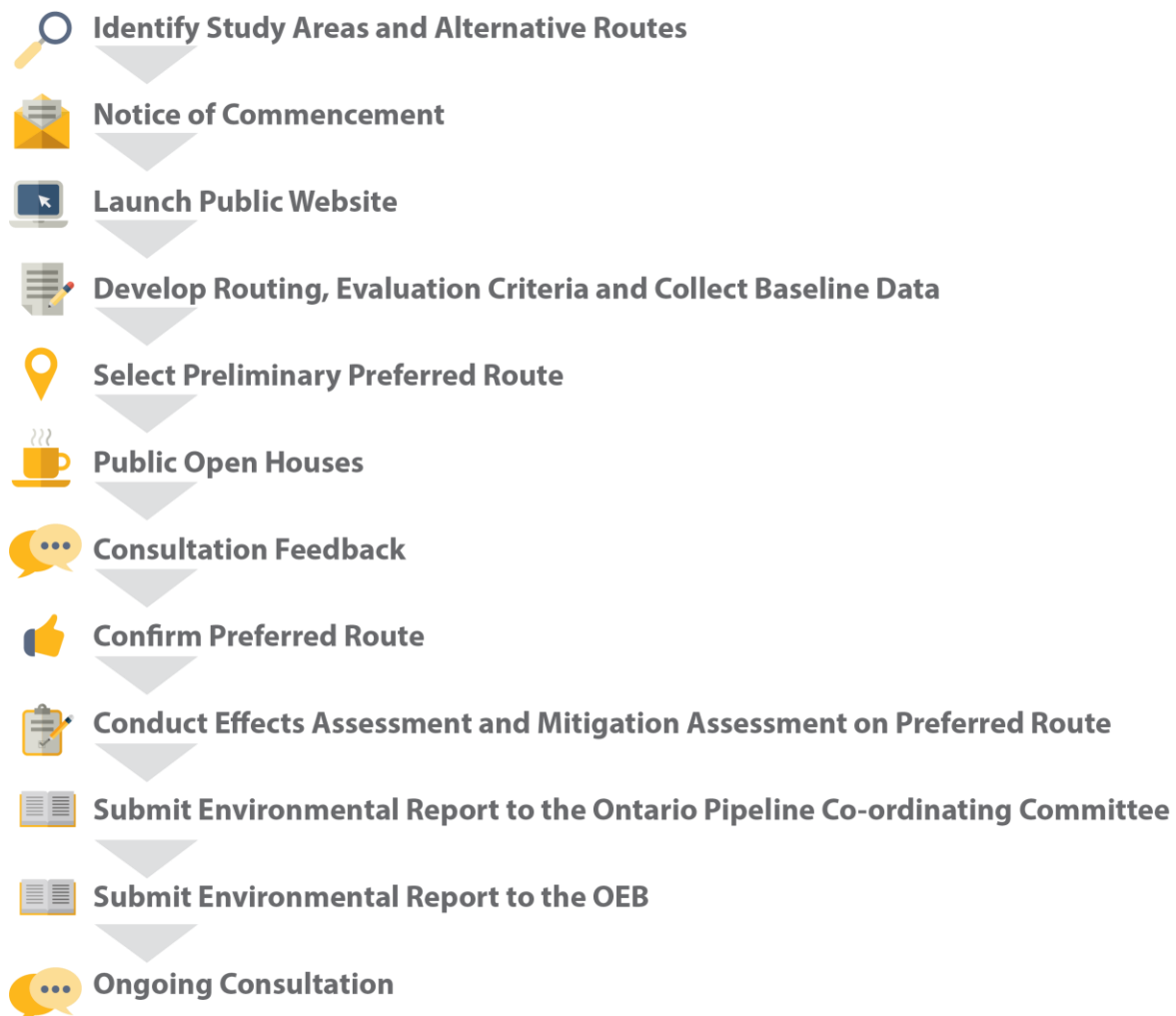
The Study process followed three main steps:

1. Identification of Study Areas and Environmental Inventory
2. Routing Constraints Analysis
3. Effects Assessment and Proposed Mitigation Measures

Stakeholder engagement and Indigenous consultation was conducted throughout the Study (see **Section 3.0**). The Study process is illustrated in **Figure 4** and described in further detail in the following subsections.

Figure 4: Environmental Assessment (EA) Process and Consultation Flow Chart

EA PROCESS AND CONSULTATION FLOW CHART



2.1 Study Methods

The Study methods were designed to achieve the following objectives:

- Select a Study Area;
- Collect environmental and socio-economic data to evaluate the potential routes;
- Provide opportunities for Indigenous communities, agencies, potentially-affected landowners, and the general public to comment on the Project;
- Choose a Preferred Route for the pipeline that reduces adverse effects to the physical, natural, and socio-economic environment; and,
- Identify and recommend environmental protection and mitigation measures to be implemented during pipeline construction.

The Study was conducted between November 2019 and May 2020.

2.1.1 Identification of Study Area and Environmental Inventory

The first step of the Study involved identifying the Study Area for the Project. The Study Area boundaries were determined based on the pre-established start and end points of the replacement pipeline and included areas that are most likely to be directly or indirectly affected by the Project.

To address potential adverse effects on indirectly-affected Indigenous communities, stakeholders and landowners, Dillon conducted desktop studies that encompassed 125 m on each side of the potential routes for a total width of 250 m. The Study Area boundaries for Phase 3 and Phase 4 are depicted on **Figure 2** and **Figure 3**, respectively.

An environmental and socio-economic constraints inventory and a features mapping exercise was conducted. Dillon mapped features based on both primary and secondary sources including data collected through site reconnaissance activities, contact with local, provincial, and federal agencies, and discussions with stakeholders. Based on Dillon's experience conducting studies of a similar nature and, in accordance with the OEB Guidelines, the mapping generally included topographical features, natural environment features, natural hazard information, and relevant land use planning information.

The purpose of collecting applicable data to compile features mapping was to assist the Study team, Enbridge, Indigenous communities, the public, regulatory agencies, and

interested parties in understanding how the environment may be affected by the Project. Feature maps serve as the baseline for route evaluation and for assessing the potential adverse effects resulting from construction and operation of the pipeline.

To confirm potential adverse effects on directly-affected Indigenous communities, stakeholders and landowners, Dillon undertook a field program that encompassed 30 m on each side of the potential routes (centreline) for a total width of 60 m (Project footprint). This was done to encompass the permanent pipeline easement, as well as potential temporary workspace required to accommodate pipeline construction.

Primary and secondary source data was collected and used to develop the environmental and socio-economic baseline setting for the Project. Primary sources include data retrieved during field studies, and secondary sources include data obtained through the review of electronic databases, published reports, existing literature, journals, information letters, and information received from Project stakeholders. Proper record-keeping practices were exercised to maintain data and results for future use. Methods used to retrieve information included internet research and correspondence with agencies and other stakeholders. A list of key secondary sources is included in **Table 2**. Secondary sources reviewed as part of the Stage 1 Archaeological Assessment are included in **Appendix A**.

Table 2: Key Data Records and Sources

Source	Records Reviewed
PROVINCIAL	
Land Information Ontario (LIO); accessed March 2020	<ul style="list-style-type: none"> • Interactive Online Mapping Tool
Natural Heritage Information Centre (NHIC)	<ul style="list-style-type: none"> • GIS database of occurrence records for natural heritage features. Uses 1 km squares based on the military grid reference system. Reviewed to determine historical occurrence records of: <ul style="list-style-type: none"> – Species of Conservation Concern and SAR; – Rare and exemplary plant communities; – Wildlife concentration areas; and – Natural areas. • NHIC 1 km squares reviewed: 17PJ2832, 17PJ2932, 17PJ2933, 17PJ3032, 17PJ3033, 17PJ3133, 17PJ3134, 17PJ3233, 17PJ3234.
Ontario Ministry of Natural Resources and Forestry (MNRF)	<ul style="list-style-type: none"> • Significant Wildlife Habitat Technical Guide (MNR 2000) and Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015).
<i>O. Reg. 242/08</i> (General)	<ul style="list-style-type: none"> • Reviewed to determine SAR with regulated habitat located within the municipality (City of Ottawa) within the Study Area.
<i>O. Reg. 230/08</i> (Species at Risk in Ontario [SARO] List)	<ul style="list-style-type: none"> • Reviewed to determine status of species as SAR or Species of Conservation Concern.
FEDERAL	
SAR Public Registry (Government of Canada 2020)	<ul style="list-style-type: none"> • Schedule 1 of SARA reviewed to determine status of species listed as SAR or Species of Conservation Concern.

Source	Records Reviewed
Fisheries and Oceans Canada (DFO) Online Aquatic SAR Mapping Application (DFO 2019)	<ul style="list-style-type: none"> Reviewed to determine mapped presence of aquatic SAR and/or Critical Habitat of aquatic SAR, as listed on Schedule 1 of SARA.
CONSERVATION AUTHORITY	
RVCA	<ul style="list-style-type: none"> O. Reg. 174/06 Online Regulated Area mapping Lower Rideau Subwatershed Report (RVCA 2013)
WILDLIFE ATLASES	
Atlas of Mammals of Ontario (Dobbyn 1994)	<ul style="list-style-type: none"> Distribution data for mammals overlapping the Study Area.
Ontario Breeding Bird Atlas (Cadman et al. 2007)	<ul style="list-style-type: none"> Breeding bird historical occurrence records for the 10 km grid squares overlapping the Study Area: 18WQ18 and 18WQ19.
Ontario Reptile and Amphibian Atlas (Ontario Nature 2020)	<ul style="list-style-type: none"> List of reptile and amphibian species occurrences for the 10 km grid squares overlapping the Study Area: 18WQ18 and 18WQ19.
Ontario Butterfly Atlas (Toronto Entomologists' Association 2020)	<ul style="list-style-type: none"> Lepidoptera historical occurrence records for the 10 km grid squares overlapping the Study Area: 18WQ18 and 18WQ19.
PLANNING AND POLICY	
Provincial Policy Statement (Ontario Ministry of Municipal Affairs and Housing [MMAH] 2020)	<ul style="list-style-type: none"> Policy directions related to infrastructure development and the environment.
City of Ottawa Official Plan (City of Ottawa 2003)	<ul style="list-style-type: none"> Policy directions related to infrastructure development and the environment. Land use designations.

2.1.2

Routing Constraints Analysis

A typical routing study for the Project was not feasible due to route options being limited based on the existing road infrastructure in the area and Enbridge's intent to continue to provide service to existing community members by maintaining existing connection points.

Enbridge identified the preferred routes for the proposed IP plastic mains (Phase 3), which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments (**Figure 2**). There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers. Enbridge identified the preliminary preferred route for the proposed XHP steel gas mains (Phase 4), as well as several alternative routes/route combinations (**Figure 3**). Dillon analyzed the constraints associated with Enbridge's preliminary preferred route and alternative routes for the proposed XHP gas mains, but did not identify additional alternatives for comparison.

It is understood that Enbridge identified the preliminary preferred route and alternative routes for Phase 4 of the Project in consideration of the following factors:

- Location of existing natural gas infrastructure;
- Location of previously disturbed existing transportation routes (roads/rail lines) and utility corridors/easements; and,
- Overall technical feasibility and economic viability of the route.

Dillon then conducted a constraints analysis to determine the compatibility of the preliminary preferred route and alternative routes with environmental and socio-economic characteristics and sensitivities; existing and planned developments and infrastructure; and, in consideration of potential environmental and socio-economic impacts.

The criteria Dillon considered in the routing constraints analysis included biophysical constraints (e.g., watercourses, wetlands, etc.), socio-economic constraints (e.g., residences, commercial/industrial properties, institutional buildings, recreational uses, etc.), and technical constraints (e.g., route length, major road crossings, rail crossings, etc.).

The constraints analysis conducted for the Phase 4 pipeline routes is provided in **Appendix C**. More information on the routes assessed in this ER is provided in **Section 4.0**.

2.1.3 Effects Assessment and Proposed Mitigation Measures

The next step in the Study process involved an assessment of the potential environmental and socio-economic effects of the Project, along with the identification of mitigation measures, for the Preferred Routes. The objective of the effects assessment was to:

- Predict and analyze the nature and extent of Project effects;
- Identify mitigation measures to protect valued components; and,
- Determine the significance of any effects remaining following mitigation (i.e., residual effects), including the significance of combined effects (where applicable).

Criteria were used to assess the significance of residual effects. For the purposes of this assessment, a “significant residual effect” is defined as a permanent or long-term residual effect of high magnitude that has a high probability of occurrence and cannot be technically or economically mitigated.

The study methods for the cumulative effects assessment are described in **Section 7.0**.

Mitigation measures were identified that conform to Enbridge’s Construction and Maintenance Manual, as well as the relevant permitting authority requirements, including the OEB. The development of the mitigation measures was also based on Dillon’s professional experience and field study, feedback received as part of the consultation program, industry best practices, and guidelines provided by local conservation authorities and other agencies. Recommended mitigation measures are described in **Section 6.0**.

Pending regulatory approval, Enbridge plans to begin construction of Phase 3 of the Project in Q2 2021 and construction of Phase 4 is anticipated to begin in Q1 2022. Construction is anticipated to take approximately 3 years from ground preparation to clean-up and testing, weather permitting. Construction will involve a number of distinct steps that may have some environmental effects. These steps are described below and are depicted in **Appendix D**.

- **Right-of-Way Preparation:** Involves staking or marking the pipeline location, identifying where other utilities are located, clearing vegetation (only as required), sweeping for wildlife, placing wildlife exclusion fencing (as required), and grading to allow for the movement of equipment and preparation of workspace. In urban areas, asphalt is removed and disposed of at landfills or licensed facilities. In vegetated areas, topsoil along the right-of-way is stripped and stored in piles for replacement after construction. Crews re-stake the centre point of trench line/route.
- **Pipe Delivery and Pipe Preparation:** Trucks will deliver pipes in sections to avoid having to stack large quantities of pipe. Crews lay out or string sections of the pipe along the right-of-way.
- **Joining Pipe Sections:** Pipes are then welded (steel pipe) or fused (polyethylene pipe) into one long piece, following the contour of the land. X-rays (steel pipe) and visual inspections (steel pipe and polyethylene pipe) will be undertaken to confirm the integrity of the joints. Where welded joints are required, the welded joints are coated.
- **Trenching/HDD:** Pipeline is installed via open trench or trenchless construction methods. Backhoes, excavators, or other machinery are used to dig trenches along the staked or marked points. Entry and exit pits will be identified for specific trenchless construction activities.
- **Lowering the Pipe:** Crews use side booms/cranes to lower the pipe into the trench or through the drilled passage.
- **Backfilling:** Excavated material is either reused or clean fill is brought in to backfill the trench. Large stones and other debris materials are removed from the backfill to prevent pipeline damage. Subsoil and topsoil are then laid over the trench. Anything disturbed by construction (such as fences and pavement) is repaired or replaced. Vegetative cover is replaced by sodding or seeding where required.
- **Testing:** The new pipeline will be nitrogen tested or hydrostatically tested. The pipeline is sealed then pressurized with nitrogen or filled with water and tested at a pressure higher than actual operating pressures. Nitrogen and hydrostatic tests check for leaks and confirm pipeline strength. If hydrostatically tested, water for the test may be obtained from the local municipality and either disposed of at a licensed facility or discharged in accordance with local by-laws.
- **Clean-up:** The construction area is carefully cleaned up after the trench/drill hole is completed or backfilled. All construction material and equipment is removed when

construction is completed. A final grading of the area is done and excess soil is also removed. Slope stability and re-establishment of vegetation is carefully monitored following construction. Enbridge will complete any reclamation work necessary following pipeline construction.

Activities during operations include, but are not limited to, periodic site visits, vehicle use, remote surveillance and monitoring, and integrity digs.

Potential Project interactions with the physical, natural, and socio-economic environment are identified in **Table 3**. The setting information presented in **Section 5.0** provides the context and rationale for potential interactions, which are assessed in **Section 6.0**.

Table 3: Interaction Matrix

Table notes: Interaction with the Project is indicated with yes(Y) or no (N) in the two columns, “Construction” and “Operations”.

Component	Construction	Operations
Physiography and Topography	N	N
Surficial Geology and Soils	Y	N
Bedrock	Y	N
Groundwater	Y	Y
Atmospheric Environment	Y	Y
Aquatic Environment	Y	N
Wetlands	Y	N
Areas of Natural and Scientific Interest and Other Environmentally Significant Areas	N	N
Terrestrial Habitat and Vegetation	Y	N
Wildlife and Wildlife Habitat	Y	N
Species at Risk	Y	N
Planning Policies	N	N
Existing and Planned Land Use	N	N
Population, Employment, and Economic Activities	N	N
Human Occupancy and Resource Use	Y	N
Infrastructure and Services	Y	N
Interests of Indigenous Communities	N	N

Component	Construction	Operations
Archaeological and Cultural Heritage Resources	Y	N

2.2 Stakeholder Engagement and Indigenous Consultation

Stakeholder engagement and Indigenous consultation are requirements of the Project. Early and frequent consultation and engagement with directly and indirectly affected Indigenous communities, property owners, government agencies, and the public was an integral part of this Study. The objectives of the consultation and engagement process were to:

- Identify all potentially affected parties;
- Provide information to the parties on relevant components of the Study;
- Obtain input from these parties;
- Mitigate and, where appropriate, accommodate for impacts on Aboriginal and Treaty Rights, and,
- Integrate information received into the decision-making process.

A number of methods were utilized to achieve these objectives, including:

- Identification of key community members and interest groups during the Study Area definition phase including the local conservation authority, school boards and schools, utility companies, government agencies as well as directly and indirectly impacted landowners;
- Preparation and completion of a comprehensive stakeholder engagement program;
- The provision of key Project information to Indigenous communities;
- Circulation of notices via Canada Post to over 14,500 residents and businesses in the Study Area;
- Development of a Project website to provide Project information;
- A public open house meeting to discuss the Project;
- Receipt of and response to public input through letters, e-mails and phone calls;
- Analysis of Project questionnaires from the public meeting; and,
- Circulation of information at key points in the process to Indigenous communities and all stakeholders including government agencies, residents, and other interested parties.

The stakeholder engagement and Indigenous consultation program also included early and frequent contact with regulatory agencies to provide or request information regarding the Project. Details of the stakeholder engagement and Indigenous consultation program are provided in **Section 3.0**.

3.0 Stakeholder Engagement and Indigenous Consultation Program

A comprehensive stakeholder engagement and Indigenous consultation program was undertaken for the Project. This section provides an overview of the consultation and engagement activities undertaken as part of the Study.

3.1 Objectives

The objectives of the consultation and engagement program were to:

- Inform potentially affected individuals/organizations about the Project;
- Protect Aboriginal and Treaty Rights;
- Seek and facilitate the involvement of potentially affected individuals/organizations;
- Make all reasonable efforts to identify the interests and meet the needs of participants;
- Provide participants with the information they required to participate in a meaningful way;
- Consider public issues/concerns during Project design and when making Project approval decisions;
- Incorporate feedback and evolve, as necessary, in response to the input and needs (access, format, etc.) of participants; and,
- Communicate to participants how their input affected outcomes (i.e., Project design and review/approval decisions).

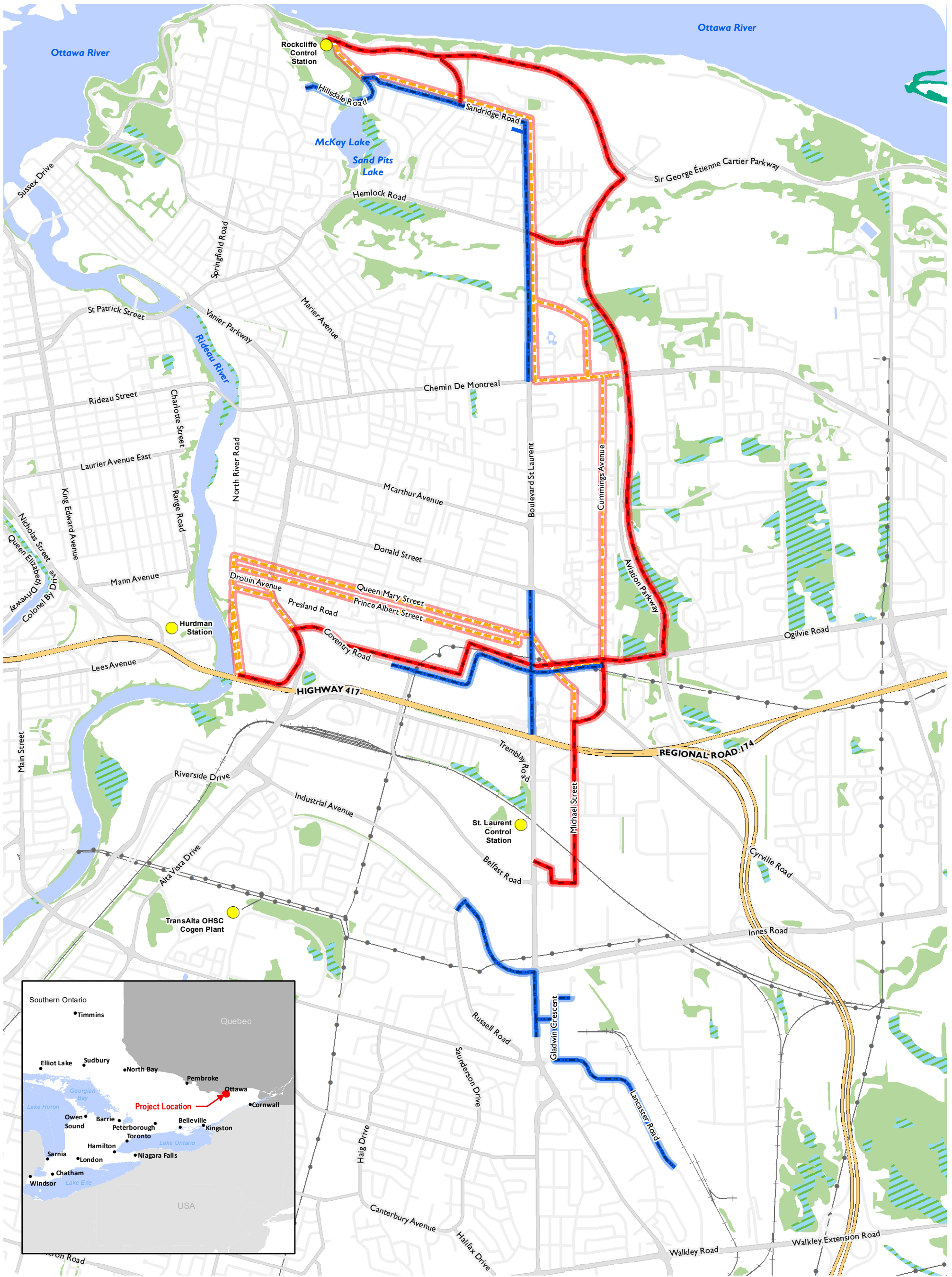
3.2 Project Components Presented to Stakeholders and the Public

The Project components that were presented to Indigenous communities, agencies, interest groups, and the public through the Notice of Commencement and Open House are shown on **Figure 5**.

Following the 30-day public comment period and completion of the first draft of the ER (March 30, 2020), additional components were determined to be required for the Phase 4 scope of work (see **Figure 3**). These components include additional NPS 4-inch and NPS 6-inch segments of XHP steel pipe along St. Laurent Boulevard and Montreal Road,

as part of the Phase 4 XHP Preferred Route, as well as the identification of an additional Phase 4 XHP alternative route from Michael Street to the St. Laurent Control Station (see **Figure 9**). These new components were not presented to stakeholders or the public for comment.

Further details on the proposed Project routes are provided in **Section 4.0**.



ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

PROJECT OVERVIEW
SHARED WITH
STAKEHOLDERS
FIGURE 5



- Proposed Routes**
- Phase 4 XHP Preferred Route
 - Phase 3 IP Segments
 - - - Alternative Routes
 - Phase 3
 - Phase 4

Gas Line Types

- NPS 12 XHP Gas Main
- - - NPS 6 XHP Gas Main
- · - · NPS 6 IP Gas Main
- · - · NPS 4 IP Gas Main
- · - · NPS 2 IP Gas Main

Base Data

- Highway
- Major Road
- Local Road
- Utility Line
- Railway

Water Body

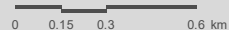
- Water Body
- Wooded Area
- / / / Unevaluated Wetland
- Provincially Significant Wetland



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:25,000



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25

3.3 Consultation Activities

From the outset, and throughout the Study process, Enbridge stressed the importance of consulting with Indigenous communities, area residents, community organizations, and government agencies. To meet the Study consultation requirements set by the OEB and set the stage for achieving Enbridge's consultation objectives, as well as meet the legal duty to consult with Indigenous communities, the stakeholder engagement and Indigenous consultation plan called for a series of communication and consultation activities that would inform the Study.

Communication activities included letters of invitation/notification, a public open house meeting, and the Enbridge Project-specific website. In addition, meetings by telephone and correspondence by electronic mail were also undertaken by the Project team.

3.3.1 Contact List

A list of regulatory agencies and interest groups active in the area was compiled through research and published information including government listings, previous studies completed in the area, the internet, and telephone calls. A contact list was developed that subdivided the groups into the following categories:

- Indigenous Communities;
- Federal and Provincial Elected Officials;
- Federal Agencies;
- Provincial Agencies, including the local Conservation Authority;
- Municipal Elected Officials and Agencies;
- Interest Groups (e.g., Neighbourhood Associations, schools, hospitals);
- OPCC; and,
- Members of the Public (e.g., residents and business owners who showed an interest in Phase 2 of the St. Laurent Pipeline Project).

All of the stakeholder groups listed above are included in the Contact List provided as **Appendix E**.

3.3.2 Project Website and Email

As a component of the consultation and engagement program, Enbridge created a Project-specific website in order to make information accessible to as many groups as possible. In addition, by including all information in a downloadable format, Enbridge provided a cost-effective and expeditious method of communicating with stakeholders.

Dillon created a Project-specific email inbox (StLaurentNorthEA@dillon.ca) that was used to communicate directly with stakeholders. The Project-specific email inbox will be monitored and emails will continue to be responded to throughout the OEB process and until substantial construction on the Project is complete.

All material presented at public meetings, public notices, and reports are posted on the Project website at <https://www.enbridgegas.com/about-us>. Click on the “**Projects**” tab and navigate to “**St. Laurent Ottawa North Pipeline Project**”. The final ER will be posted on the Project website in a downloadable format once it has been submitted to the OEB for review. **Figure 6** shows a snapshot of the Project website.

Figure 6: Snapshot of Project Website

The screenshot shows the Enbridge website interface. At the top, there is a navigation bar with the Enbridge logo, a search bar, and menu items: 'My Account', 'Using Natural Gas', 'Natural Gas and the Environment', 'Safety', and 'SIGN IN'. Below the navigation bar is a yellow banner with an 'IMPORTANT NOTICE' regarding the merger of Enbridge Gas Distribution and Union Gas into Enbridge Gas Inc. The main content area features a 'HOME MORE THAN ENERGY' section with a heading 'More than energy' and a paragraph explaining the company's history and mission. To the right of the text is a photograph of several people sitting on the grass, some wearing Enbridge-branded vests. Below the text and photo is a horizontal menu with options: 'About Us', 'News', 'Regulatory', 'Projects', and 'Careers'. The 'Projects' menu item is highlighted in yellow. Underneath the 'Projects' menu, there is a 'Projects' section with a sub-heading and a paragraph. Below this is a dropdown menu for 'Storage Enhancement Project' which is expanded to show four options: 'Overview', 'Project information', 'Environmental report', and 'Public consultation'.

3.3.3 Public Notice

A Notice of Study Commencement and Open House (Notice) was mailed to approximately 14,500 residences and businesses in the Study Area during the week of February 10, 2020 via Canada Post. A copy of the Notice is provided in **Appendix F**.

Consultation logs for interest group and public correspondence are provided in **Appendix G**.

3.3.4 Contact Letters

Letters requesting environmental and socio-economic data and inviting government agencies (i.e., federal, provincial, and municipal) to the Open House were distributed the week of February 10, 2020.

To expedite the process, agency letters were sent by electronic mail (copies of the letters sent to agencies are provided in **Appendix H**). Consultation logs for agency correspondence are provided in **Appendix G**, along with the interest group and public consultation logs.

3.3.5 Public Open House

The public Open House was held on Tuesday, February 25, 2020 at the Saint-Louis-Marie-de-Montfort Parish (749 Trojan Avenue, Ottawa).

The purpose of the Open House was to provide an opportunity for public comment on the Study and planning process, and the potential routes. The Open House was designed to achieve the following objectives:

- Introduce participants to the Project, the Study process, and consultation plans; and,
- Seek feedback from participants on local environmental and socio-economic considerations, issues, or concerns that should be addressed as part of the Study.

At the Open House, a number of panels were prepared to present the Project and to provide an overview of the environmental assessment process, design, and construction of the Project. Panels were presented in English and a French-translated version was available as a handout at the sign-in desk. The panels discussed the following:

- Purpose of the Open House (Introduction to Enbridge);
- Enbridge's Indigenous Peoples Policy;
- Project Introduction and Location;
- Baseline Studies – Desktop and Field;
- Pipeline Design and Safety;
- Pipeline Construction;
- Working around Natural Features;
- Mitigation and Monitoring;
- Regulatory Framework (OEB);

- Permits and Approvals;
- Continuous Stakeholder Engagement; and,
- Environmental Assessment Process and Project Schedule.

A copy of the panels is provided in **Appendix I**.

3.3.5.1 Results from Open House

The Open House was attended by 14 people. In addition to personnel from Dillon, Enbridge staff were also present at the Open House to answer questions and listen to comments from interested agencies and members of the community. The majority of the Open House attendees were local residents in the Project Study Area.

Participants were asked to complete a questionnaire once they had a chance to see the panels and speak to the Project team. A total of 10 questionnaires were completed and 8 respondents identified themselves as property owners and/or residents in the Study Area.

Of those completing the questionnaire, 8 respondents indicated they were supportive of the Project and 2 respondents indicated they had no opinion (i.e., neutral). All respondents indicated that they understood the need for the Project.

The primary concerns with the Project were related to:

- Removal of trees and potential effects on greenspace along Aviation Parkway; and,
- Traffic disruptions and access restrictions along the potential alternative routes, if the Aviation Parkway route is not chosen.

3.3.5.2 Route Refinements Resulting from Public Input

There was no opposition to the Project noted during the public Open House or in comments received via the questionnaires and Project email inbox. Most respondents were supportive of the preliminary preferred route identified for the XHP pipeline (along Aviation Parkway), noting that many of the alternative routes would be more disruptive to traffic and business. None of the comments received materially affected the routing of the potential pipeline routes.

3.4 Agency Consultation

A list of all agency stakeholders that were consulted on the Project is provided in the Contact List (**Appendix E**).

The NCC and MTO provided specific feedback concerning the routing of the Phase 4 XHP Preferred Route.

The NCC noted that Enbridge's preferred route for the NPS 12-inch XHP pipeline along Aviation Parkway may conflict with future plans for an interprovincial bridge crossing project and noted they preferred one of the alternative routes along St. Laurent Boulevard and Cummings Avenue. Enbridge is currently in ongoing discussions with the NCC regarding the feasibility of the alternative routes and is seeking a mutually agreeable solution for the construction of the NPS 12-inch XHP pipeline along the preferred Aviation Parkway route.

The MTO noted various concerns with the proximity of the Phase 4 XHP Preferred Route to the Highway 417 corridor and its interchanges. Specifically, the routing near the westbound on-ramp at Coventry Road and Vanier Parkway (**Figure 5**). As a result of this consultation, Enbridge refined the route at that location by moving the route west into an adjacent parking lot in order to further offset it from the highway on-ramp (**Figure 3**).

3.5 Indigenous Consultation

On December 3, 2019, and as per OEB Guidelines, an email was sent to the Ministry of Energy, Northern Development and Mines (MENDM) providing notification of Enbridge's intent to submit an LTC Application to the OEB for the Project and requesting the MENDM's assessment of Duty-to-Consult requirements.

In a letter dated January 30, 2020, the MENDM determined that the Project may have the potential to affect Aboriginal and Treaty Rights and provided a list of the following communities that should be consulted:

- Algonquins of Ontario; and,
- Mohawk Council of Akwesasne.

Letters, accompanied by the Notice of Study Commencement and Open House, were sent to the Indigenous communities on February 5 and February 14, 2020 to introduce

the Project and provide an opportunity to comment. The notification letter invited the communities to provide input and comments regarding the proposed Project, specifically regarding potential impacts that the Project may have on constitutionally protected Aboriginal or Treaty Rights and any measures for mitigating those impacts. Enbridge also requested the opportunity to meet with each community to discuss the Project.

Consultation with Indigenous communities, to date, is summarized in **Appendix J**. An Indigenous Consultation Report will be submitted as part of the LTC Application under separate cover.

3.6 Ongoing Engagement Activities

Although the ER has been completed, Enbridge is committed to ongoing communication with Indigenous communities, agencies, stakeholders, and the public.

As of the writing of this ER, Enbridge is in ongoing dialogue with the NCC in order to come to a mutually agreeable solution for implementing the Phase 4 XHP Preferred Route along Aviation Parkway and is continuing conversations with the MTO regarding Project routing in proximity to the Highway 417 corridor.

Enbridge will continue to actively engage all identified Indigenous groups in meaningful dialogue concerning the Project and endeavour to meet with each Indigenous community for the purposes of exchanging information regarding the Project, responding to inquiries, discussing issues and concerns regarding the Project; and will respond to communities in a timely manner. A full consultation record with Indigenous communities will be documented in the Indigenous Consultation Report to be submitted with the LTC Application under separate cover.

4.0 Route Selection

As described in **Section 0**, Enbridge identified the pipeline routes for Phase 3 and Phase 4 of the Project. The constraints analysis conducted for the Phase 4 XHP pipeline routes is provided in **Appendix C**.

As noted in **Section 3.2**, the Project components that were presented to Indigenous communities, agencies, interest groups, and the public are shown on **Figure 5**. The Project components considered in this ER are described in the following subsections and include the additional Project components identified after the public comment period and the first draft of the ER were completed (as shown on **Figure 7**, **Figure 8**, and **Figure 9**).

4.1 Preferred Routes

The Phase 3 Preferred Routes for the Project are shown on **Figure 7**. For ease of identification throughout the ER, the Phase 3 Preferred Routes are identified as follows:

- **Phase 3 IP Segment 1** – runs east along Hillsdale Road and Sandridge Road to St. Laurent Boulevard and then runs south along St. Laurent Boulevard to Montreal Road
- **Phase 3 IP Segment 2** – runs south along St. Laurent Boulevard from Donald Street to Highway 417
- **Phase 3 IP Segment 3** – runs west along Ogilvie Road from Cummings Avenue to St. Laurent Boulevard, then continues west onto Coventry Road from St. Laurent Boulevard to Belfast Road
- **Phase 3 IP Segment 4** – begins at the intersection of Russell Road and Industrial Avenue and follows Industrial Avenue east to St. Laurent Boulevard, then follows St. Laurent Boulevard south to a point just past Bourassa Street; it stems off to the east along Bourassa Street to Gladwin Crescent, which it follows north to the end of the crescent and south to Lancaster Road, which it follows for approximately 1 km, south of the intersection with Gladwin Crescent

The **Phase 4 XHP Preferred Route** selected for the Project is the preliminary preferred route identified by Enbridge and is shown on **Figure 8**. The Phase 4 XHP Preferred Route for the north-south portion of the pipeline runs from the Rockcliffe Control Station and

follows Sir George-Étienne Cartier Parkway to the Aviation Parkway, which it then follows for most of its length before briefly turning west along Ogilvie Road and then running south along Michael Street. The route then briefly goes west on Belfast Road before heading north on Lagan Way and then west again on Shore Street where it crosses St. Laurent Boulevard to tie into the St. Laurent Control Station. The Phase 4 XHP Preferred Route for the east-west portion of the pipeline runs from the intersection of Aviation Parkway and Ogilvie Road and runs west along Ogilvie Road and then Coventry Road to the Vanier Parkway, which it follows south to Highway 417 and then west to the Rideau River.

The Phase 4 XHP Preferred Route also includes the following proposed XHP pipeline segments for which there are no alternatives.

- **Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard)** – an approximately 1.5 km segment of NPS 4-inch XHP steel pipe that begins at Sandridge Road and Birch Avenue and goes west on Sandridge Road, then south on St. Laurent Boulevard to a point midway between Hemlock Road and Brittany Drive
- **Phase 4 XHP Preferred Route, NPS 4-inch Segment (Hemlock Road)** – an approximately 500 m segment of NPS 4-inch XHP steel pipe along Hemlock Road from Aviation Parkway to St. Laurent Boulevard
- **Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road)** – an approximately 700 m segment of NPS 6-inch XHP steel pipeline along Montreal Road from Aviation Parkway to St. Laurent Boulevard

4.2 Alternative Routes

Enbridge identified various alternative routes/route combinations for Phase 4 of the Project (**Figure 9**). For ease of identification throughout the ER, the Phase 4 XHP Alternative Routes are identified as follows:

- **Phase 4 XHP North-South Alternative 1** – begins at the Rockcliffe Control Station, following Hillsdale Road and Sandridge Road east to St. Laurent Boulevard and then follows St. Laurent Boulevard south to Montreal Road, then heads east along Montreal Road to Cummings Avenue which it then follows south to Ogilvie Road and then follows the alignment of the Phase 4 XHP Preferred Route along Labelle Street and Michael Street and then west on local/minor roads to St. Laurent Boulevard

- **Phase 4 XHP North-South Alternative 2** – begins at the Rockcliffe Control Station, following Hillsdale Road and Sandridge Road east to St. Laurent Boulevard and then follows St. Laurent Boulevard south to Brittany Drive, which it follows east then south to Montreal Road and briefly follows Montreal Road east before continuing south along Cummings Avenue to Ogilvie Road and then follows the alignment of the Phase 4 XHP Preferred Route along Labelle Street and Michael Street and then west on local/minor roads to St. Laurent Boulevard
- **Phase 4 XHP North-South Alternative 3** – follows the same route as North-South Alternative 1 up to the intersection of Michael Street and Parisien Street, where it heads west on Parisien Street and then south on Triole Street and then immediately west again on Tremblay Road to the west side of St. Laurent Boulevard, which it follows south to the St. Laurent Control Station
- **Phase 4 XHP North-South Alternative 4** – follows the same route as North-South Alternative 2 up to the intersection of Michael Street and Parisien Street, where it heads west on Parisien Street and then south on Triole Street and then immediately west again on Tremblay Road to the west side of St. Laurent Boulevard, which it follows south to the St. Laurent Control Station
- **Phase 4 XHP East-West Alternative 1** – begins at the intersection of Ogilvie Road and Cummings Avenue and follows Ogilvie Road west to Cyrville Road which it follows northwest to St. Laurent Boulevard and briefly travels north on St. Laurent Boulevard before heading west again on Queen Mary Street to River Road, then follows River Road south to Highway 417
- **Phase 4 XHP East-West Alternative 2** – begins at the intersection of Ogilvie Road and Cummings Avenue and follows Ogilvie Road west to Cyrville Road which it follows northwest to St. Laurent Boulevard, crossing under St. Laurent Boulevard and continuing west on Prince Albert Street to River Road, then follows River Road south to Highway 417
- **Phase 4 XHP East-West Alternative 3A** – begins the same as East-West Alternative 1 (Queen Mary Street), however, instead of following River Road all the way to Highway 417, the route would head east from River Road on West Presland Road and then follow the Vanier Parkway south to Highway 417
- **Phase 4 XHP East-West Alternative 3B** – begins the same as East-West Alternative 1 (Queen Mary Street), however, instead of following River Road all the way to

Highway 417, the route would head east from River Road on Drouin Avenue and then follow the Vanier Parkway south to Highway 417

- **Phase 4 XHP East-West Alternative 4A** – begins the same as East-West Alternative 2 (Prince Albert Street), however, instead of following River Road all the way to Highway 417, the route would head east from River Road on West Presland Road and then follow the Vanier Parkway south to Highway 417
- **Phase 4 XHP East-West Alternative 4B** – begins the same as East-West Alternative 2 (Prince Albert Street), however, instead of following River Road all the way to Highway 417, the route would head east from River Road on Drouin Avenue and then follow the Vanier Parkway south to Highway 417
- All of the east-west XHP alternatives include a short segment that would run south down Cyrville Road from the intersection at Ogilvie Road to join up with the Phase 4 XHP Preferred Route along Michael Street.

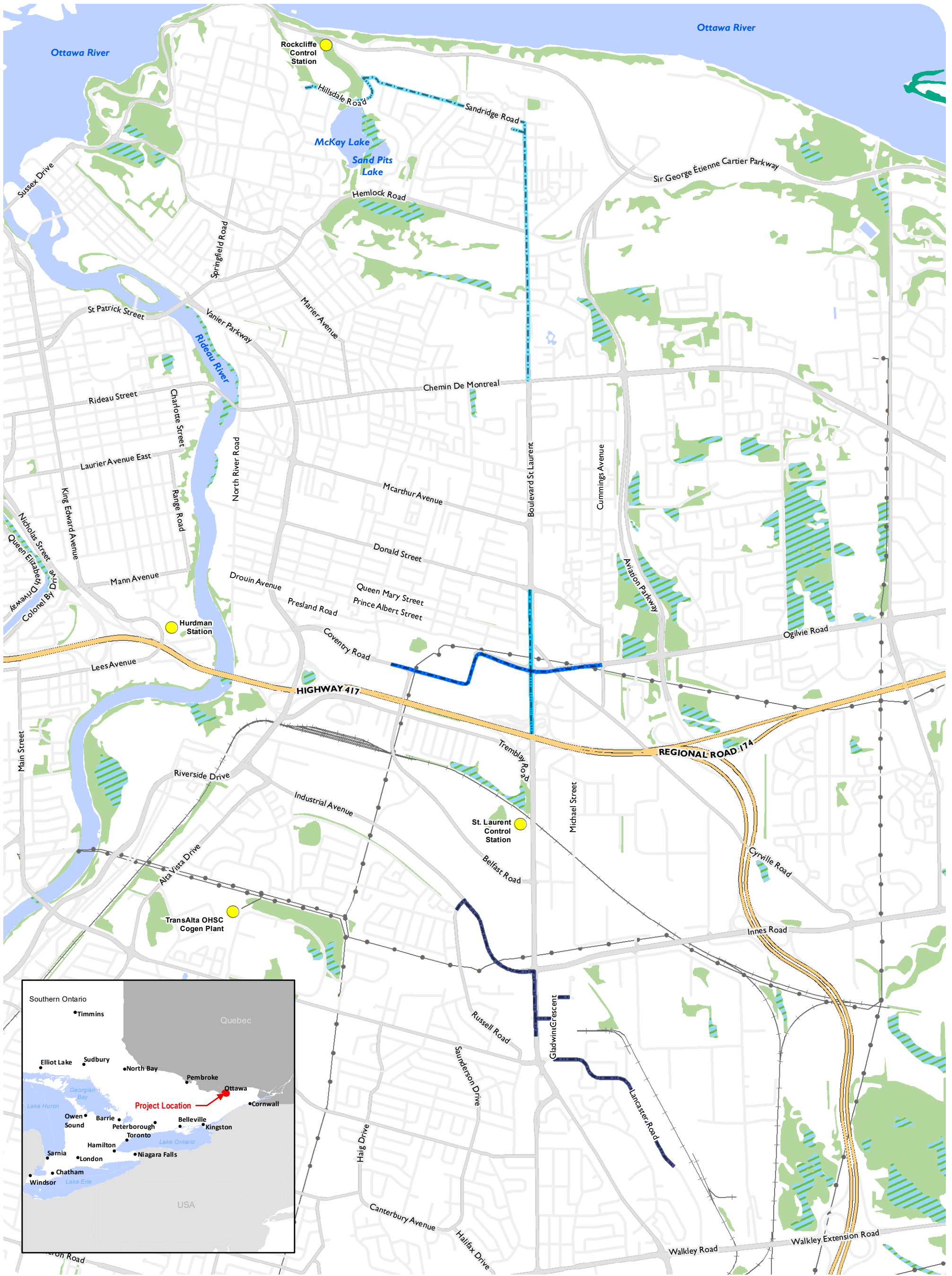
4.3 Temporary Workspace and Laydown Areas

Temporary facilities for the purpose of the Project may include equipment staging areas and soil stockpile areas. Temporary facilities will be required prior to and during the construction period. The location of the temporary facilities will be determined by Enbridge and their contractor during construction planning.

Field work completed for the Project included lands located approximately 30 m on each side of the road right-of-way (i.e., Project footprint) and can be used to site temporary facilities. When siting temporary facilities, the following criteria should be used to minimize adverse environmental and socio-economic effects:

- Identify locations within previously disturbed areas;
- Select locations close to the area of construction to minimize ground disturbance;
- Avoid areas with native vegetation and other natural features such as woodlands;
- Avoid, where possible, known locations of SAR;
- Avoid sloped and poorly drained areas; and,
- Avoid areas with known cultural heritage/archaeological resources.

Mitigation measures provided in **Section 6.0** of this ER should be considered when siting temporary facilities. Applicable agency approvals will be required.



ENBRIDGE GAS INC.
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REPLACEMENT PIPELINE PROJECT

**PREFERRED ROUTES -
PHASE 3**
FIGURE 7



Proposed Routes

- Phase 3 IP Segment 1
- Phase 3 IP Segment 2
- Phase 3 IP Segment 3
- Phase 3 IP Segment 4

Gas Line Types

- NPS 6 IP Gas Main
- NPS 4 IP Gas Main
- NPS 2 IP Gas Main

Base Data

- Highway
- Major Road
- Local Road
- Utility Line
- Railway

Water Body

- Water Body
- Wooded Area
- Unevaluated Wetland
- Provincially Significant Wetland



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:25,000

0 0.15 0.3 0.6 km



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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

**PREFERRED ROUTES -
PHASE 4**
FIGURE 8



Proposed Routes
Phase 4 XHP Preferred Route

Gas Line Types

- NPS 16 XHP Gas Main
- NPS 12 XHP Gas Main
- NPS 6 XHP Gas Main
- NPS 4 XHP Gas Main

Base Data

- Highway
- Major Road
- Local Road
- Utility Line
- Railway

Water Body

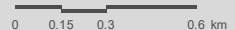
- Water Body
- Wooded Area
- Unevaluated Wetland
- Provincially Significant Wetland
- Provincial Boundary



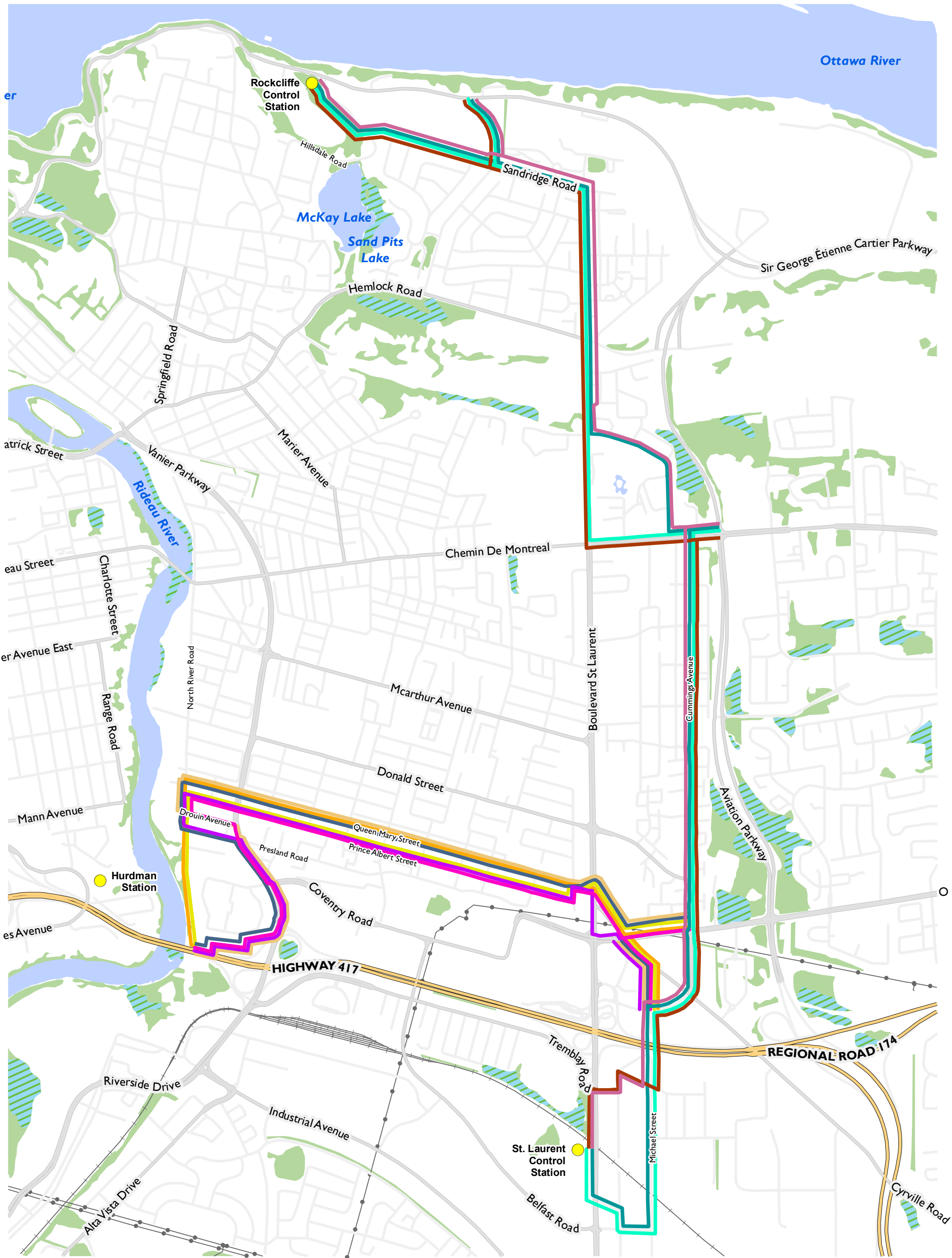
MAP DRAWING INFORMATION:
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SCALE 1:25,000



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**ALTERNATIVE ROUTES -
PHASE 4
FIGURE 9**



- Station
- Phase 4 Preferred and Alternative Routes
- Phase 4 XHP East-West Alternative 1
- Phase 4 XHP East-West Alternative 2
- Phase 4 XHP East-West Alternative 3A
- Phase 4 XHP East-West Alternative 3B
- Phase 4 XHP East-West Alternative 4A

- Phase 4 XHP East-West Alternative 4B
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

Base Data

- Highway
- Major Road
- Local Road
- Utility Line
- Railway

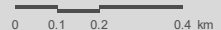
- Water Body
- Wooded Area
- Unevaluated Wetland

Note: Routes have been offset for visualization purposes.

MAP DRAWING INFORMATION:
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SCALE 1:18,000



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25

5.0 Physical, Natural, and Socio-Economic Environment Setting

This section describes the existing physical, natural, and socio-economic environment setting for lands that are located within the Study Area established for the Project.

5.1 Physical Environment

This subsection provides baseline information on the following components:

- Physiography and Topography;
- Surficial Geology and Soils;
- Bedrock; and,
- Groundwater.

5.1.1 Physiography and Topography

The Project is located within the physiographic region known as the Ottawa Valley Clay Plains (Chapman and Putnam 2007), which is characterized by post-Champlain Sea deposits containing clayey abandoned river channel deposits with silt and silty clay, as well as sand lenses underlain by unmodified marine clay (Chapman and Putnam 1984).

Topography in the Study Area generally ranges in elevation from approximately 88 metres above sea level (masl) to 47 masl, with the highest elevation approximately 300 m north of the intersection of Montreal Road and Aviation Parkway. Topography along each of the potential pipeline routes is discussed in more detail below.

- **Phase 3 IP Segment 1** – Topography ranges from 47 masl to 74 masl with the lowest point at a watercourse crossing (bridge crossing over a creek overflow from McKay Lake draining north to the Ottawa River). The point of highest elevation is on St. Laurent Boulevard, approximately 300 m north of Montreal Road.
- **Phase 3 IP Segment 2** – Topography ranges from 63 masl to 70 masl generally decreasing in elevation from the north to the south, with the lowest point at the Highway 417 underpass.
- **Phase 3 IP Segment 3** – Topography ranges from 65 masl to 71 masl generally decreasing in elevation from the east to the west.

- **Phase 3 IP Segment 4** – Topography west of St. Laurent Boulevard ranges from 67 masl to 74 masl, with the maximum elevation at the intersection that is the entrance to 775 Industrial Avenue. Topography east of St. Laurent Boulevard is generally level, ranging between 67 masl and 69 masl.
- **Phase 4 XHP Preferred Route, North-South Segment** – Topography along the north-south portion of the Phase 4 XHP Preferred Route ranges in elevation from approximately 53 masl to 86 masl. Elevation is generally level along Sir George-Étienne Cartier Parkway, apart from a gradual incline approaching Aviation Parkway. A mapped watercourse (tributary to the Ottawa River) exists approximately 260 m south of the intersection of Sir George-Étienne Cartier Parkway and Aviation Parkway. Elevation increases to the south between Aviation Parkway and a topographic high point approximately 300 m north of the intersection of Montreal Road and Aviation Parkway. Elevation decreases along Aviation Parkway until approximately 500 m south of Montreal Road at which point the elevation is relatively level. A mapped watercourse exists along Ogilvie Road, approximately 80 m west of Aviation Parkway. The mapped watercourse flows to the southeast to Green’s Creek.
- **Phase 4 XHP Preferred Route, East-West Segment** – Topography along the east-west portion of the Phase 4 XHP Preferred Route ranges from 58 masl to 71 masl, generally decreasing in elevation from the east to west.
- **Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard)** – Topography ranges in elevation from 62 masl to 66 masl, generally increasing in elevation from the north to south.
- **Phase 4 XHP Preferred Route, NPS 4-inch Segment (Hemlock Road)** – Topography ranges in elevation from 63 masl to 70 masl, generally increasing in elevation from the east to west.
- **Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road)** – Topography ranges in elevation from 70 masl to 84 masl, generally increasing in elevation from the east to west.
- **Phase 4 XHP North-South Alternatives 1, 2, 3, and 4**– Topography ranges in elevation from approximately 54 masl to 80 masl. Elevation is generally level along Hillsdale Road and increases gradually to the east on Sandridge Road until St. Laurent Boulevard. The topography from St. Laurent Boulevard to Montreal Road is undulating with an overall increase in elevation until approximately 300 m north of

Montreal Road. Elevation decreases slightly at the intersection of Montreal Road and St. Laurent Boulevard, increasing along Montreal Road to the East until Cummings Avenue. Elevation decreases along Cummings Avenue for approximately 250 m. Elevation is generally level with a gradual slope to the south along the remainder of Cummings Avenue.

- **Phase 4 XHP East-West Alternatives 1, 2, 3A, 3B, 4A, and 4B** – Topography ranges from 58 masl to 71 masl, generally decreasing in elevation from the east to west.

5.1.2 Surficial Geology and Soils

5.1.2.1 Surficial Geology

Surficial geologic mapping indicates the Study Area lies within a mixed zone of Pleistocene-aged overburden deposits, comprised of the following types:

- Fine-textured glaciomarine deposits comprised of silt and clay;
- Older alluvial deposits of mixed clay, silt, sand and gravel;
- Colluvial deposits (i.e., unconsolidated sediment of boulders, scree, talus, and undifferentiated landslide materials); and,
- Organic deposits of peat, muck, and marl.

Where present, the overburden thickness ranges from approximately 0 m to 15 m (Ontario Geological Survey [OGS] 1991). Small portions of the Study Area consist of exposed Paleozoic bedrock.

A description of the surficial geology along each of the potential pipeline routes is provided below.

Phase 3 Routes

The surficial geology underlying the majority of Phase 3 IP Segment 1 is comprised of older alluvial deposits of clay, silt, sand, gravel (may contain organic remains). A section of the alignment between its westernmost extent on Hillsdale Road and the intersection of Sandridge Road and Lakeview Drive is within fine-grained glaciomarine deposits of massive to well-laminated silt and clay, minor sand, and gravel. A small section of organic deposits occurs between approximately 60 m and 210 m south of Hemlock Road. Exposed Paleozoic bedrock exists along St. Laurent Boulevard approximately 80 m north and 400 m south of Brittany Drive.

The surficial geology underlying Phase 3 IP Segments 2, 3 and 4 is comprised of fine-grained glaciomarine deposits of massive to well-laminated silt and clay, minor sand, and gravel.

Phase 4 XHP Preferred Route

The surficial geology underlying the majority of the Phase 4 XHP Preferred Route is comprised of fine-grained glaciomarine deposits of massive to well-laminated silt and clay, minor sand, and gravel. Older alluvial deposits of clay, silt, sand, and gravel (may contain organic remains) are mapped in two separate stretches on Aviation Parkway between approximately 340 m north of Hemlock Road and 190 m south of Hemlock Road; and approximately 110 m south of Montreal Road and approximately 150 m south of La Cité Private. A small section of the Phase 4 XHP Preferred Route from approximately 200 m south of Hemlock Road to approximately 400 m south of Hemlock Road crosses through a mapped area of colluvial deposits (boulders, scree, talus, and undifferentiated landslide materials). Small portions of the Phase 4 XHP Preferred Route are within an area of exposed Paleozoic bedrock. Exposed bedrock occurs along Aviation Parkway from approximately 570 m north of Montreal Road and approximately 200 m north of Montreal Road; on a small portion of Labelle Street from approximately 70 m northeast of Cyrville Road and approximately 70 m southwest of Cyrville Road; and on Michael Street approximately 95 m south of Kenaston Street and approximately 250 m south of Kenaston Street.

Phase 4 XHP Preferred Route, NPS 4-inch Segments (St. Laurent Boulevard and Hemlock Road)

The surficial geology underlying the majority of the Phase 4 XHP Preferred Route, NPS 4-inch Segments (St. Laurent Boulevard and Hemlock Road) is comprised of older alluvial deposits of clay, silt, sand, and gravel (may contain organic remains) .

Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road)

The surficial geology underlying the western portion of the Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road) is comprised of older alluvial deposits of clay, silt, sand, and gravel (may contain organic remains). The eastern 300 m of the route is comprised of fine-grained glaciomarine deposits of massive to well-laminated silt and clay, minor sand, and gravel.

Phase 4 XHP Alternative Routes

The surficial geology underlying the majority of Phase 4 XHP North-South Alternatives 1 to 4 is comprised of older alluvial deposits of clay, silt, sand, and gravel (may contain organic remains). The surficial geology underlying four areas along these routes is comprised of fine-grained glaciomarine deposits of massive to well-laminated silt a clay, minor sand, and gravel; these deposits occur between the Rockcliffe Control Station and the intersection of Sandridge Road and Lakeview Drive; along Montreal Road, in the vicinity of Montreal Road and Brittany Drive; approximately 70 m south of Montreal Road on Cummings Avenue; and on Cummings Avenue, between approximately 500 m north of Ogilvie Road and Ogilvie Road. Exposed Paleozoic bedrock also exists along St. Laurent Boulevard approximately 80 m north of Brittany Drive and approximately 400 m south of Brittany Drive (Phase 4 XHP North-South Alternatives 1 and 3), on Brittany Drive (Phase 4 XHP North-South Alternatives 2 and 4), and along Michael Street approximately 200 m north of Belfast Road (Phase 4 XHP North-South Alternatives 1 and 2). Organic deposits underlie a small area between approximately 60 m and 210 m south of Hemlock Road and along St Laurent Boulevard, south of Tremblay Road (Phase 4 XHP North-South Alternatives 3 and 4).

The surficial geology underlying the majority of Phase 4 East-West Alternatives 1, 2, 3A, 3B, 4A, and 4B is comprised of fine-grained glaciomarine deposits of massive to well-laminated silt and clay with minor sand and gravel. A small section of older alluvial deposits of clay, silt, sand, and gravel (may contain organic remains) is mapped between Frances Street and approximately 25 m to 50 m west of Lola Street.

5.1.2.2

Soils

The Project is located in an urban setting and does not encounter agricultural land. Much of the Project footprint consists of heavily disturbed soils.

A search of the Federal Contaminated Sites Inventory revealed no recorded, historical contamination within 100 m of the Project footprint (Treasury Board of Canada Secretariat 2020). A search of the MECP (2020a) Record of Site Condition database revealed two records within the Study Area. A Record of Site Condition was filed on January 30, 2020 for 1076-1335 Hemlock Road (RSC #226470), however, the historical contamination being investigated is not within the Project footprint. In addition, a Record of Site Condition was filed on June 25, 2015 for 460 St. Laurent Boulevard (RSC

#218328), indicating historic soil exceedances and subsequent site remediation. No other Records of Site Condition have been filed since July 1, 2011 to indicate possible historical contamination within the Project footprint (MECP 2020a).

During consultation with the NCC, the NCC shared that a 2006 Phase I Environmental Site Assessment indicated the presence of a former gas station located in the area of Montreal Road and Aviation Parkway and that there may be potential to encounter hydrocarbons in that area. The NCC also indicated that the north portion of the Phase 4 XHP Preferred Route may be in the vicinity of a former runway of the Canadian Forces Base (CFB) Rockcliffe. While the NCC is not aware of soil or groundwater contamination in the vicinity of the former runway, they advised Enbridge to consider the potential for encountering contamination related to former runway activities and operations.

5.1.3

Bedrock

The Study Area lies over Middle Ordovician and Lower Ordovician bedrock consisting of sandstone, shale, limestone, dolostone, and siltstone (OGS 1991).

Underlying the overburden soils and occasionally exposed to the surface within the Study Area are a sequence of Ordovician-aged sedimentary rocks (Lower Ordovician Rockcliffe Formation, Middle Ordovician Bobcaygeon Formation and Lindsay Formation, Upper Ordovician Billings Formation and Carlsbad Formation). These bedrock formations are characterized by sandstone, shale, limestone, dolostone, and siltstone (OGS 1991).

The varying overburden thickness ranges from 0 m to 15 m. Portions of Phase 3 IP Segment 1, the Phase 4 XHP Preferred Route, and Phase 4 XHP North-South Alternatives 1 to 4 are located in areas of exposed bedrock.

Short portions of Phase 3 IP Segment 1, Phase 4 XHP North-South Alternatives 1 and 3, and Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard) are located in an area of exposed bedrock associated with the Bobcaygeon, Lindsay, and Billings formations, from 650 m to 200 m north of Montreal Road.

Short portions of the Phase 4 XHP Preferred Route are within a mapped area of exposed Paleozoic bedrock. Exposed bedrock (Bobcaygeon Formation) is mapped along Aviation Parkway from approximately 570 m and 200 m north of Montreal Road. Another small portion of exposed bedrock is mapped on Labelle Street from approximately 70 m

northeast of Cyrville Road and approximately 70 m southwest of Cyrville Road (Billings Formation), and on Michael Street approximately 95 m south of Kenaston Street and approximately 250 m south of Kenaston Street (Carlsbad Formation).

5.1.4 Groundwater

The Study Area lies within the jurisdiction of the RVCA in the Ottawa River East and Lower Rideau River subwatersheds. Phase 3 IP Segment 1, Phase 4 XHP North-South Alternatives 1 and 3, and Phase 4 XHP Preferred Route, NPS 4-inch Segments (St. Laurent Boulevard and Hemlock Road) cross an area of significant groundwater recharge.

Detailed policy information for new development within mapped Well Head Protection Areas (WHPAs) and Intake Protection Zones (IPZs) have been developed by the Mississippi-Rideau Source Protection Region. WHPAs and IPZs have been identified as areas that are particularly susceptible to surface water contamination (spills, leaks, surface leaching, etc.). The Project does not overlap WHPZ or IPZs within the City of Ottawa (MECP 2020b).

Highly Vulnerable Aquifer (HVA) areas are considered particularly susceptible to contamination due to shallow, near-surface groundwater or a permeable soil layer above the aquifer, and are dispersed throughout the City of Ottawa (MECP 2020b). The Phase 3 and Phase 4 Preferred and Alternative routes lie in HVA areas along portions of their lineation. The construction and operation of a natural gas pipeline is not identified as a drinking water threat under the *Ontario Clean Water Act* (SO 2006, c. 22).

Well information contained in the MECP (2020c) Water Well Information System (WWIS) was reviewed in the vicinity of the Phase 3 and Phase 4 Preferred and Alternative routes to better understand local groundwater conditions. There were a total of 180 unique well IDs located within 100 m of the proposed routes. These records include 62 records for water supply wells, 92 observation wells, 13 abandoned wells, and 13 records without status information available. The wells identified within 100 m of the routes range in depth between 123.4 metres below ground surface (mbgs) and 1.8 mbgs, with an average depth of approximately 17.3 mbgs. One well record (Well ID 1508659) noted that the well had artesian flows, equivalent to a pressure of 0.6 m above top of casing or negative 0.6 mbgs. Records of static water levels range between 14.0 mbgs and -0.6 mbgs with an average static level of 3.4 mbgs. Based on an

evaluation of the drilling contractors' notes contained in the well logs, groundwater was found at depths ranging from 91.4 mbgs to 0.5 mbgs, with an average "water found" depth of 23.7 mbgs. Bedrock was reported to be encountered between 15.2 mbgs and 0.9 mbgs with an average depth of 4.6 mbgs.

There is a great deal of overlap in the wells identified within 100 m of the Phase 4 XHP North-South Alternatives 1 to 4, the Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard), and Phase 3 IP Segment 1; as well as significant overlap between the Phase 4 XHP East-West Alternatives (1, 2, 3A, 3B, 4A, and 4B). A complete list of wells within 100 m of each of the potential routes is provided for reference in **Appendix K**.

5.2 Natural Environment

This subsection provides baseline information on the following components:

- Atmospheric Environment;
- Aquatic Environment;
- Wetlands;
- Areas of Natural and Scientific Interest and other Environmentally Sensitive Areas;
- Terrestrial Habitat and Vegetation;
- Wildlife and Wildlife Habitat; and
- Species at Risk.

Existing natural environment features are shown on **Figure 10** and Ecological Land Classification (ELC) within the Study Area is shown on **Figure 11**.



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REPLACEMENT PIPELINE PROJECT

EXISTING NATURAL FEATURES
FIGURE 10
MAP 1 OF 6

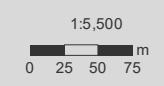


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 1
- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

- Watercourse
- Waterbody
- Unevaluated Wetland
- Wooded Area



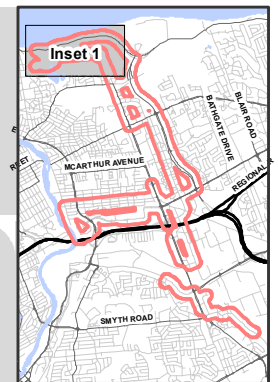
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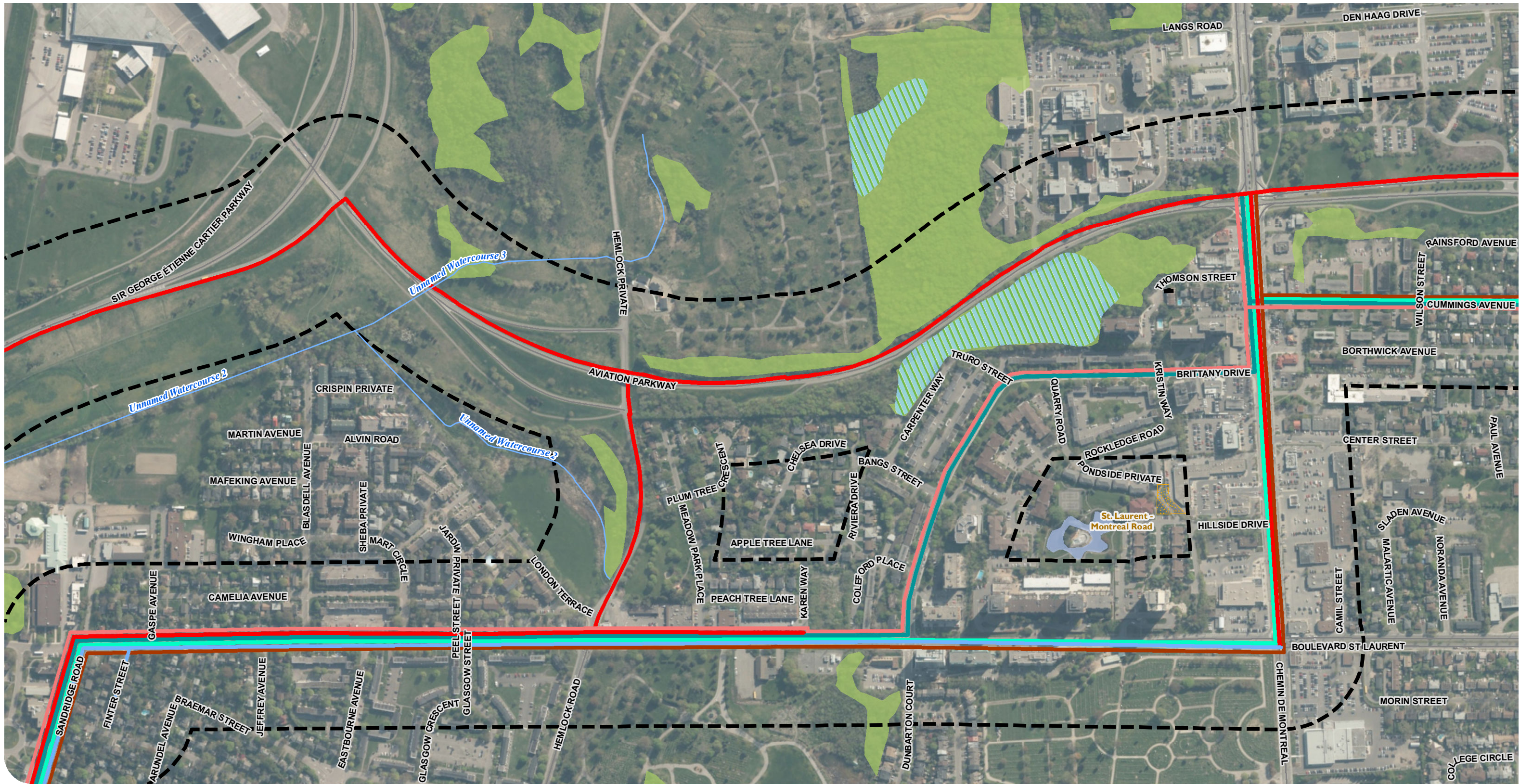


Notes:
- Routes have been offset for visualization purposes.



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





ENBRIDGE GAS INC.
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EXISTING NATURAL FEATURES
FIGURE 10
MAP 2 OF 6

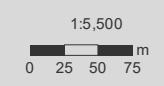


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 1
- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

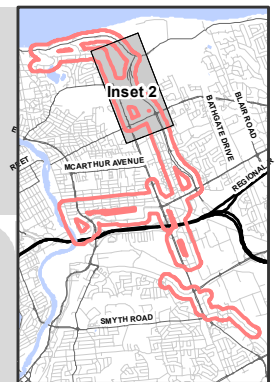
- Watercourse
- Waterbody
- Unevaluated Wetland
- Wooded Area
- ANSI, Earth Science

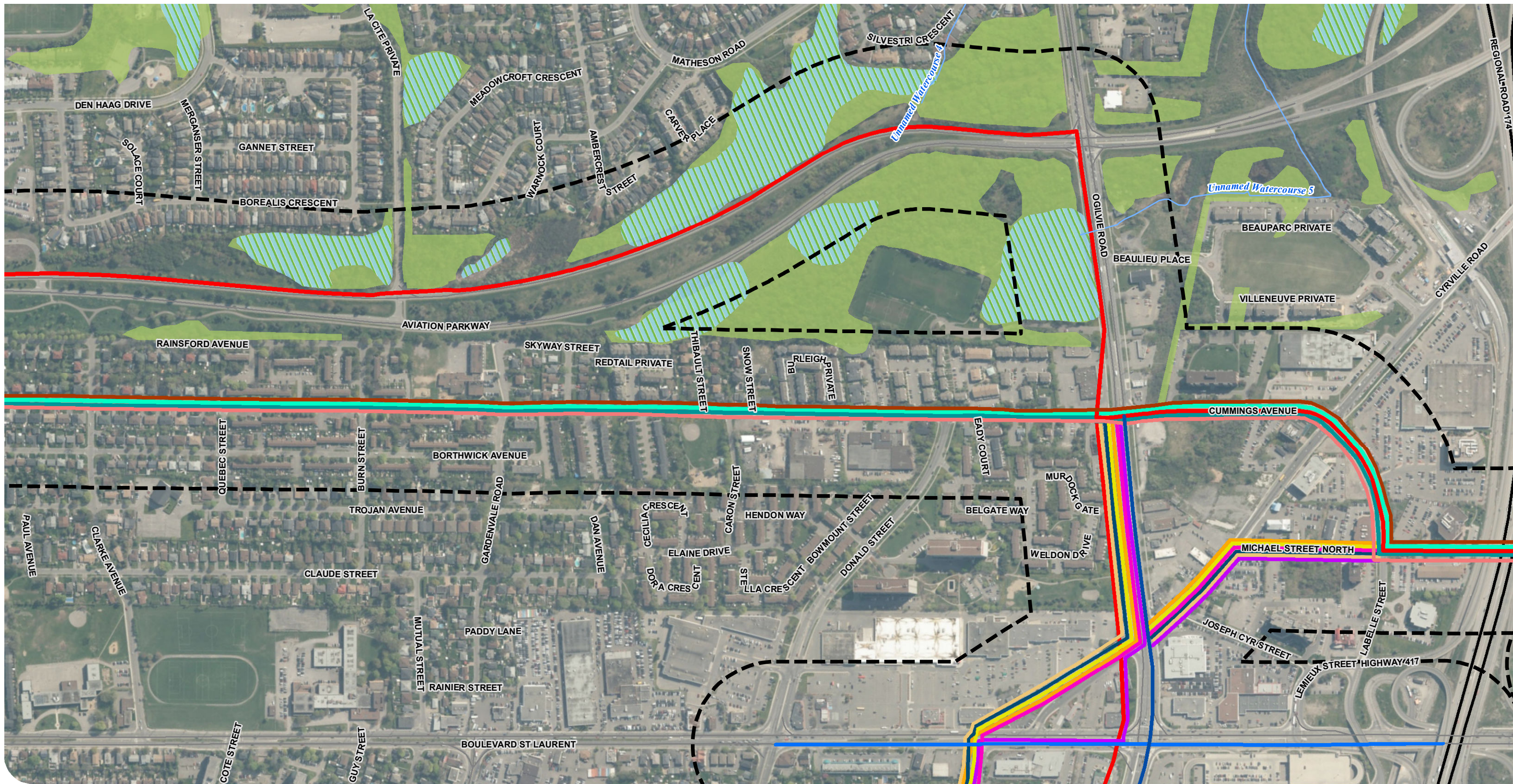


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REPLACEMENT PIPELINE PROJECT

EXISTING NATURAL FEATURES
FIGURE 10
MAP 3 OF 6

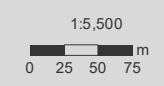


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 2
- Phase 3 IP Segment 3
- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
- Phase 4 XHP East-West Alternative 1
- Phase 4 XHP East-West Alternative 2
- Phase 4 XHP East-West Alternative 3A
- Phase 4 XHP East-West Alternative 3B
- Phase 4 XHP East-West Alternative 4A
- Phase 4 XHP East-West Alternative 4B
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4
- Watercourse
- Unevaluated Wetland
- Wooded Area

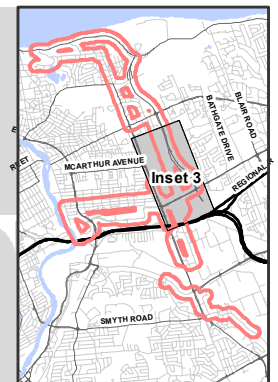


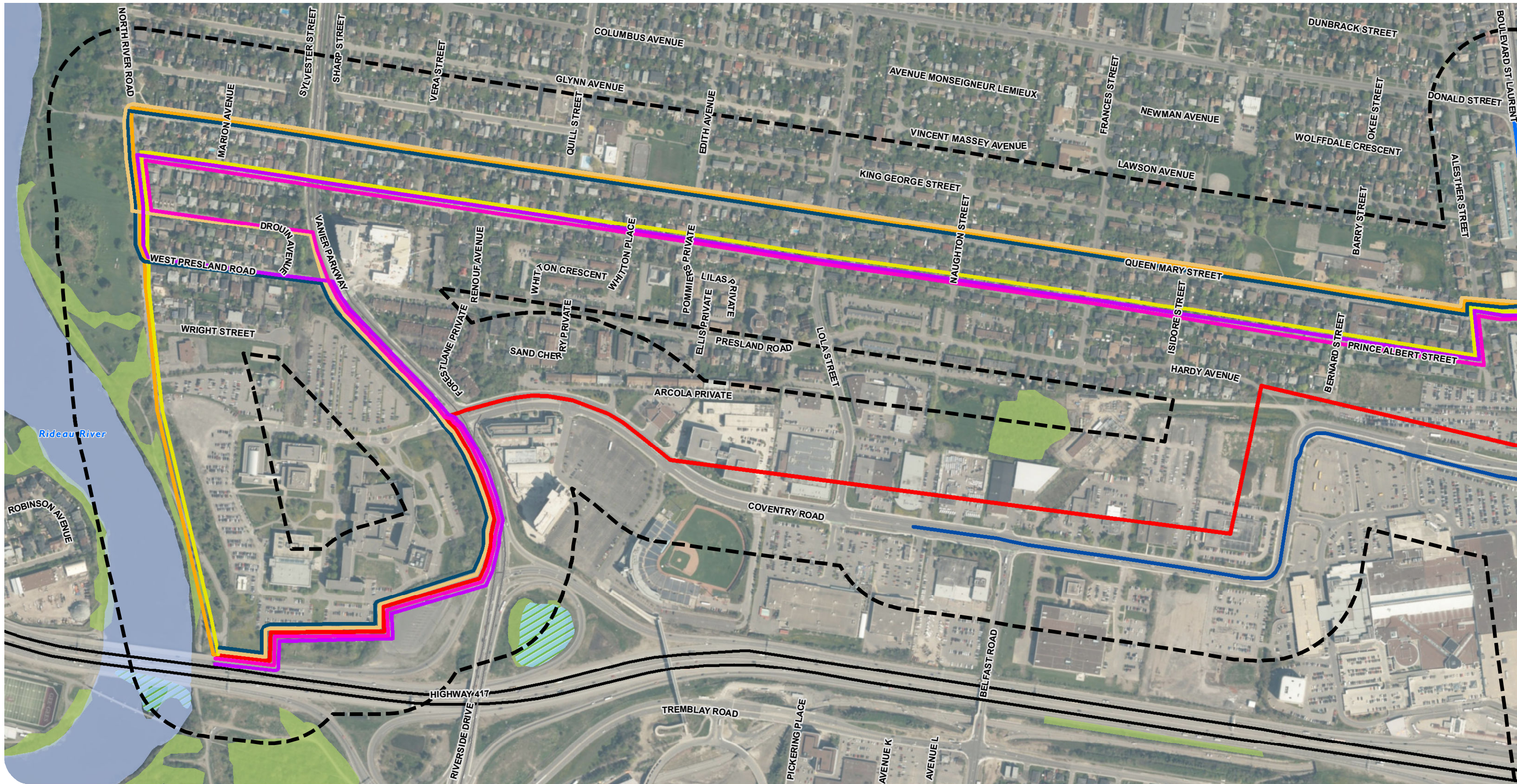
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MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
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Notes:
- Routes have been offset for visualization purposes.





ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

EXISTING NATURAL FEATURES
FIGURE 10
MAP 4 OF 6

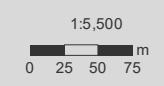


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
 - Phase 3 IP Segment 2
 - Phase 3 IP Segment 3
- Phase 4 Preferred and Alternative Routes**
 - Phase 4 XHP Preferred Route
 - Phase 4 XHP East-West Alternative 1
 - Phase 4 XHP East-West Alternative 2
 - Phase 4 XHP East-West Alternative 3A
 - Phase 4 XHP East-West Alternative 3B
 - Phase 4 XHP East-West Alternative 4A
 - Phase 4 XHP East-West Alternative 4B

- Waterbody
- Unevaluated Wetland
- Wooded Area



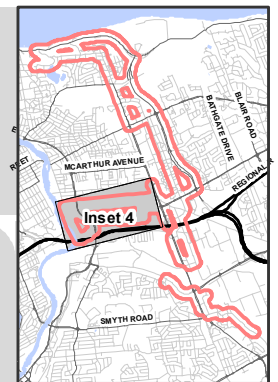
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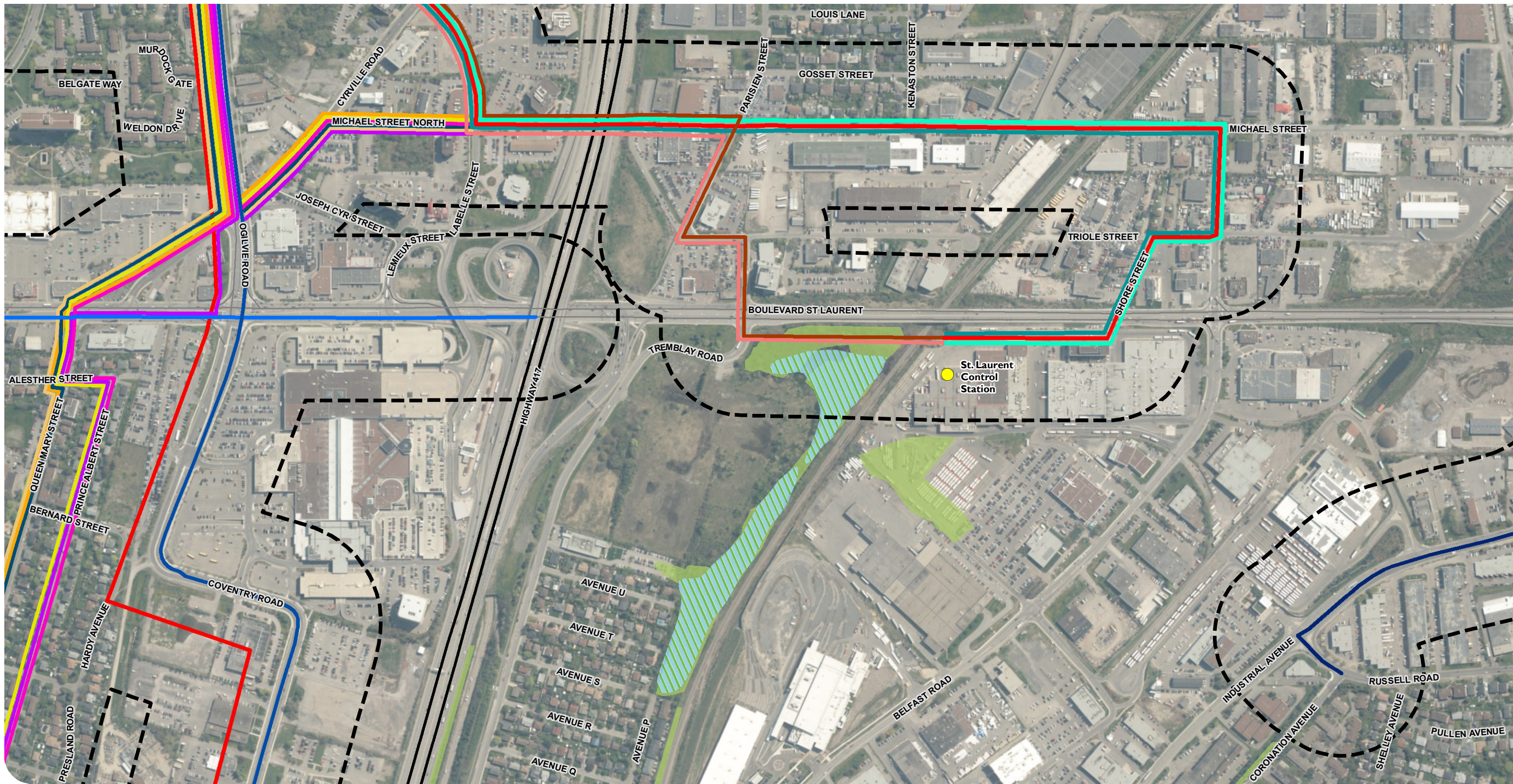


Notes:
- Routes have been offset for visualization purposes.



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ENBRIDGE GAS INC.
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EXISTING NATURAL FEATURES
FIGURE 10
MAP 5 OF 6



Control Station

Study Area (125 m)

Phase 3 Segments

Phase 3 IP Segment 2

Phase 3 IP Segment 3

Phase 3 IP Segment 4

Phase 4 Preferred and Alternative Routes

Phase 4 XHP Preferred Route

Phase 4 XHP East-West Alternative 1

Phase 4 XHP East-West Alternative 2

Phase 4 XHP East-West Alternative 3A

Phase 4 XHP East-West Alternative 3B

Phase 4 XHP East-West Alternative 4A

Phase 4 XHP East-West Alternative 4B

Phase 4 XHP North-South Alternative 1

Phase 4 XHP North-South Alternative 2

Phase 4 XHP North-South Alternative 3

Phase 4 XHP North-South Alternative 4

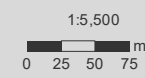
Unevaluated Wetland

Wooded Area



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ENBRIDGE GAS INC.

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MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N



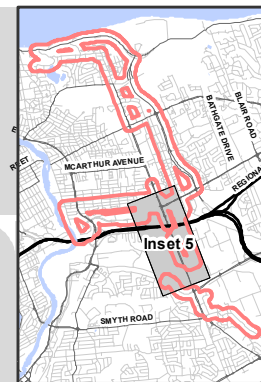
Notes:
- Routes have been offset for visualization purposes.



PROJECT: 19-1850

STATUS: FINAL

DATE: 2020-06-25





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REPLACEMENT PIPELINE PROJECT

EXISTING NATURAL FEATURES
FIGURE 10
MAP 6 OF 6

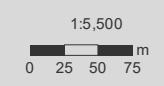


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 4
- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2

- Watercourse
- Wooded Area



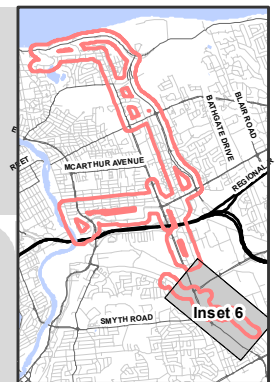
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ENBRIDGE GAS INC.
MAP CREATED BY: LK/SFG
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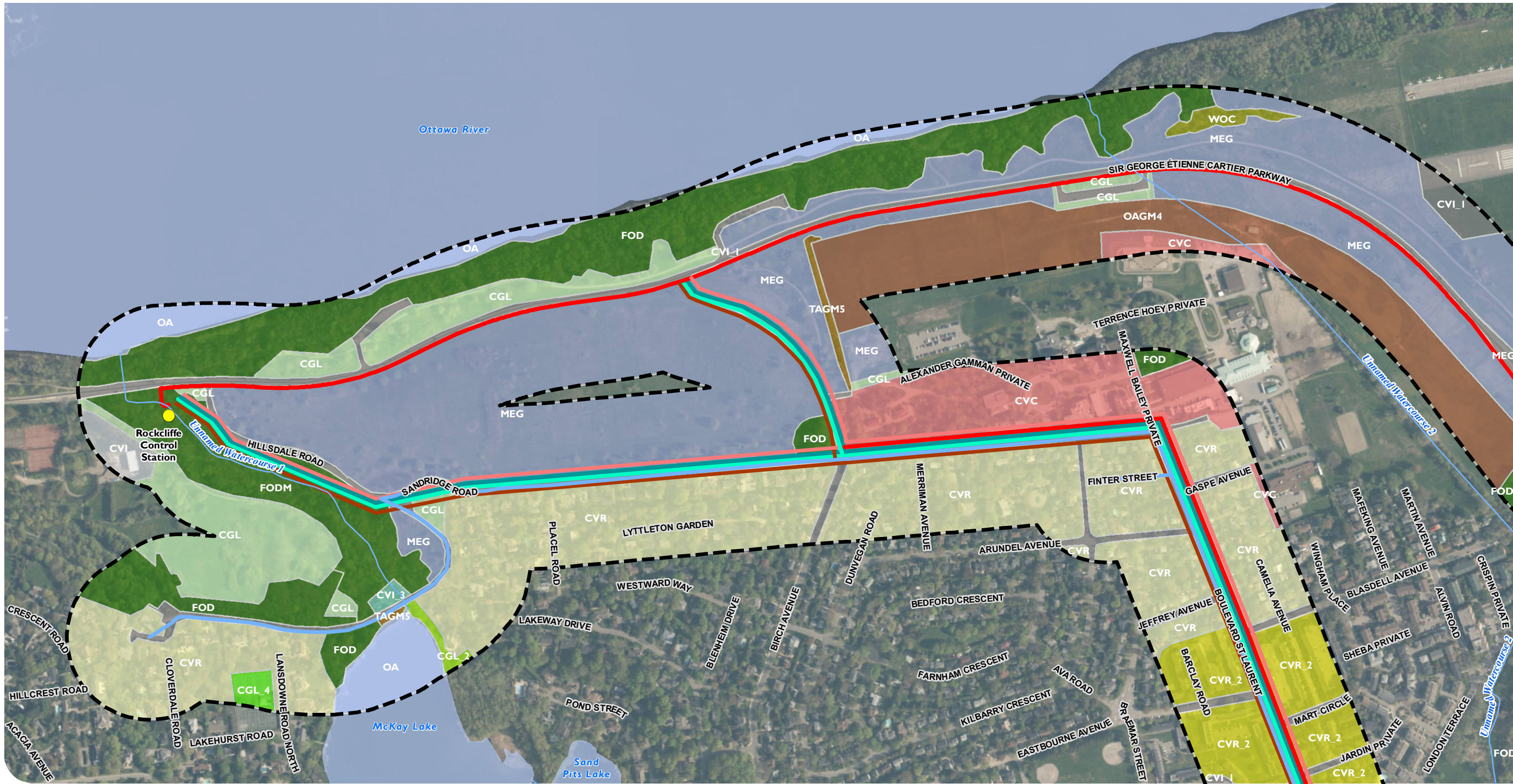


Notes:
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PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 1 OF 6

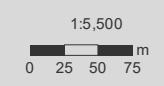


- Control Station
- Watercourse
- Study Area (125 m)
- Phase 3 IP Segment 1
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

- Ecological Land Classification**
- CGL - Greenlands
 - CGL_2 - Parkland
 - CGL_4 - Recreational
 - CVC - Commercial and Institutional
 - CVI - Transportation and Utilities
 - CVI_1 - Transportation
 - CVI_3 - Sewage and Water
 - CVR - Residential
 - CVR_2 - High Density Residential
 - FOD - Deciduous Forest
 - MEG - Graminoid meadow
 - OAGM4 - Open Pasture
 - OA - Open Water
 - TAGM5 - Fencerow
 - WOC - Coniferous Woodland

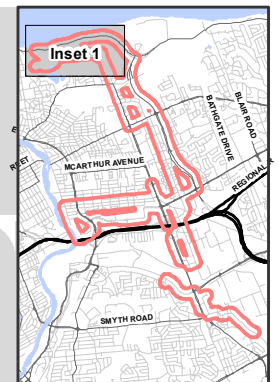


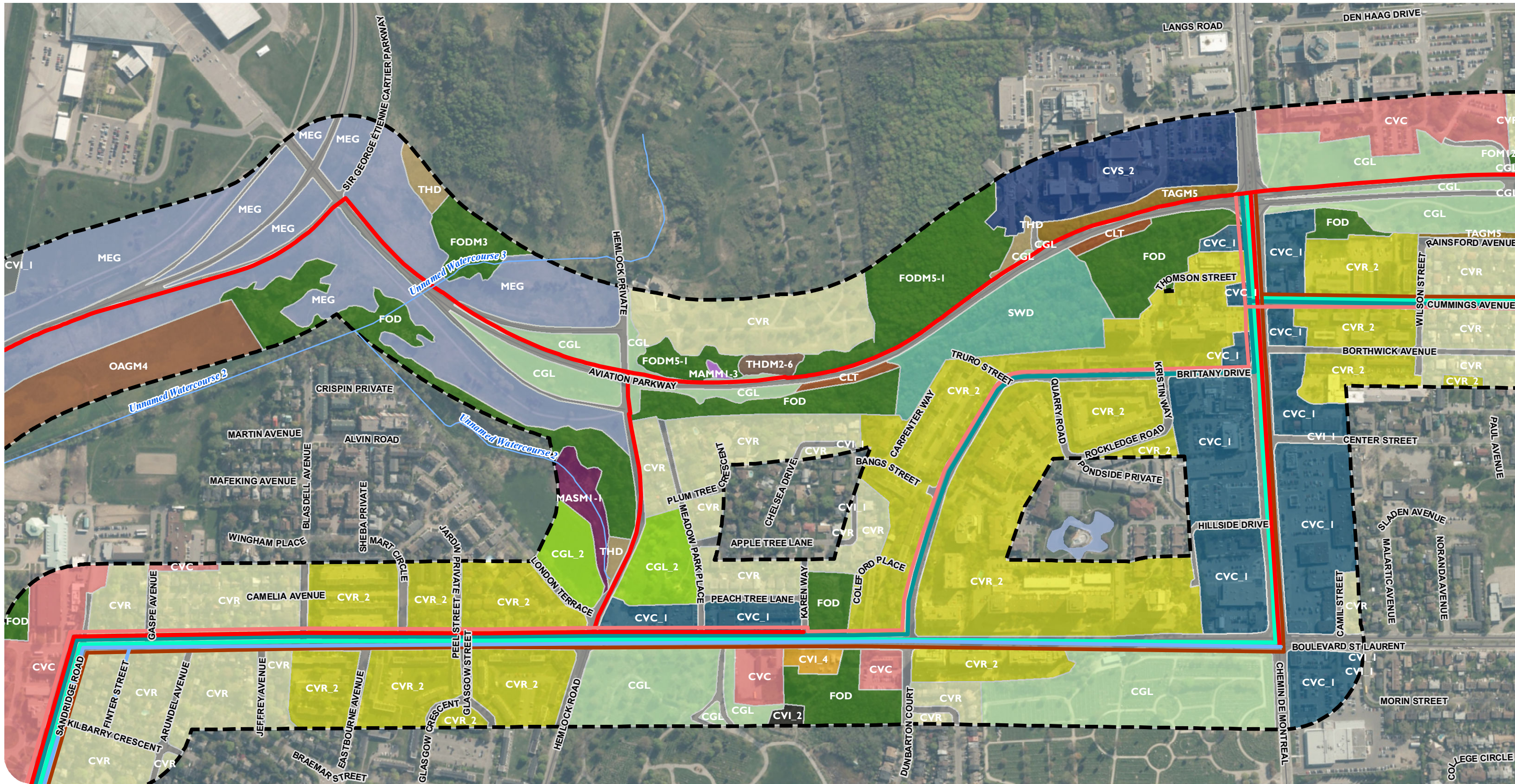
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ENBRIDGE GAS INC.
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MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N



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ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 2 OF 6



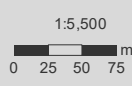
- Control Station
- Watercourse
- Study Area (125 m)
- Phase 3 Segment 1
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

- Ecological Land Classification**
- CGL - Greenlands
 - CGL_2 - Parkland
 - CLT - Treed Cliff
 - CVC - Commercial and Institutional
 - CVC_I - Business Sector
 - FOD - Deciduous Forest
 - MAMMI-3 - Reed-canary Grass Graminoid Mineral Marsh
 - MASMI-1 - Cattail Mineral Shallow Marsh
 - MEG - Graminoid meadow
 - OAGM4 - Open Pasture
 - SWD - Deciduous Swamp
 - CVI_1 - Transportation
 - CVI_2 - Disposal and Recycle
 - CVI_4 - Power Generation
 - CVR - Residential
 - CVR_2 - High Density Residential
 - CVS_2 - Hospital
 - TAGM5 - Fencerow
 - THD - Deciduous Thicket
 - THDM2-6 - Buckthorn Deciduous Shrub Thicket

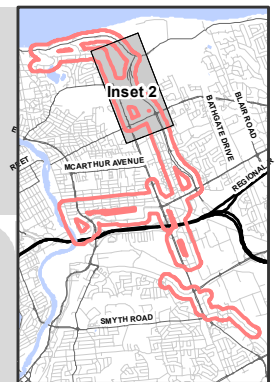


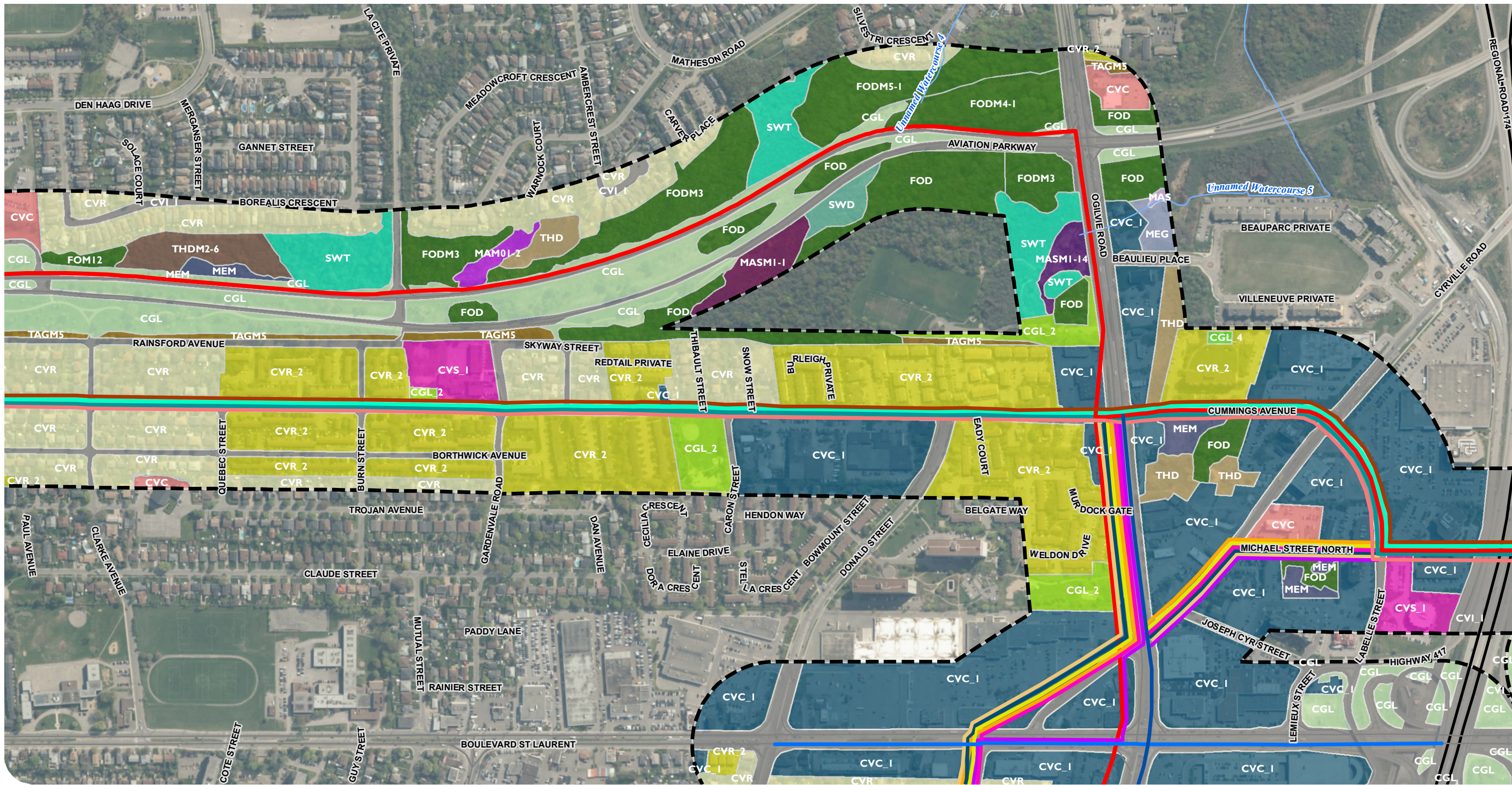
MAP DRAWING INFORMATION:
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ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 3 OF 6

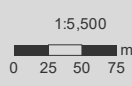


<ul style="list-style-type: none"> ● Control Station — Watercourse Study Area (125 m) Phase 3 Segments — Phase 3 IP Segment 2 — Phase 3 IP Segment 3 	<ul style="list-style-type: none"> Phase 4 Preferred and Alternative Routes — Phase 4 XHP Preferred Route — Phase 4 XHP East-West Alternative 1 — Phase 4 XHP East-West Alternative 2 — Phase 4 XHP East-West Alternative 3A — Phase 4 XHP East-West Alternative 3B — Phase 4 XHP East-West Alternative 4A — Phase 4 XHP East-West Alternative 4B — Phase 4 XHP North-South Alternative 1 — Phase 4 XHP North-South Alternative 2 	<ul style="list-style-type: none"> — Phase 4 XHP North-South Alternative 3 — Phase 4 XHP North-South Alternative 4 	<ul style="list-style-type: none"> Ecological Land Classification ■ CGL - Greenlands ■ CGL_2 - Parkland ■ CGL_4 - Recreational ■ CVC - Commercial and Institutional ■ CVC_I - Business Sector ■ CVL_I - Transportation ■ CVR - Residential ■ CVR_2 - High Density Residential ■ CVS_I - Education ■ FOD - Deciduous Forest ■ MAMO 1-2 - Cattail Graminoid Organic Meadow Marsh ■ MAS - Shallow Marsh ■ MASM 1-1 - Cattail Mineral Shallow Marsh ■ MASM 1-14 - Reed Canary Grass Mineral Shallow Marsh ■ MEG - Graminoid meadow ■ MEM - Mixed Meadow ■ SWT - Thicket Swamp ■ TAGM5 - Fencerow ■ THD - Deciduous Thicket ■ THDM2-6 - Buckthorn Deciduous Shrub Thicket 	<ul style="list-style-type: none"> ■ CVL_I - Transportation ■ CVR - Residential ■ CVR_2 - High Density Residential ■ CVS_I - Education ■ FOD - Deciduous Forest ■ MAMO 1-2 - Cattail Graminoid Organic Meadow Marsh ■ MAS - Shallow Marsh ■ MASM 1-1 - Cattail Mineral Shallow Marsh ■ MASM 1-14 - Reed Canary Grass Mineral Shallow Marsh ■ MEG - Graminoid meadow ■ MEM - Mixed Meadow ■ SWT - Thicket Swamp
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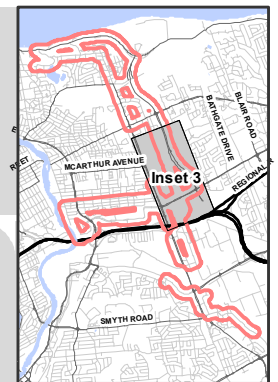


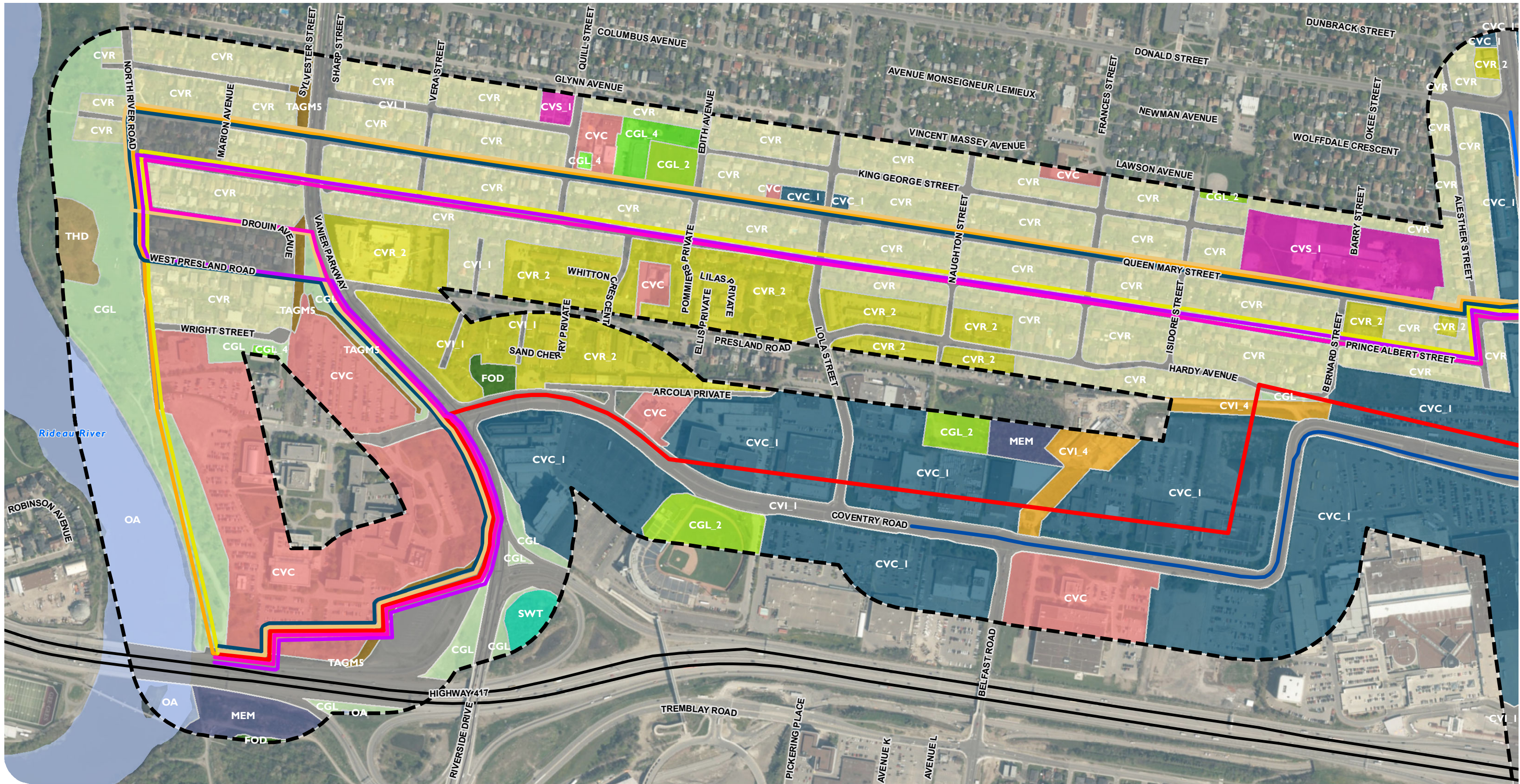
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ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 4 OF 6

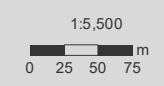


<ul style="list-style-type: none"> Control Station Study Area (125 m) Phase 3 Segments Phase 3 IP Segment 2 Phase 3 IP Segment 3 	<p>Phase 4 Preferred and Alternative Routes</p> <ul style="list-style-type: none"> Phase 4 XHP Preferred Route Phase 4 XHP East-West Alternative 1 Phase 4 XHP East-West Alternative 2 Phase 4 XHP East-West Alternative 3A Phase 4 XHP East-West Alternative 3B Phase 4 XHP East-West Alternative 4A Phase 4 XHP East-West Alternative 4B 	<p>Ecological Land Classification</p> <ul style="list-style-type: none"> CGL - Greenlands CGL_2 - Parkland CGL_4 - Recreational CVC - Commercial and Institutional CVC_1 - Business Sector FOD - Deciduous Forest 	<ul style="list-style-type: none"> CVL_1 - Transportation CVL_4 - Power Generation CVR - Residential CVR_2 - High Density Residential CVS_1 - Education FOD - Deciduous Forest 	<ul style="list-style-type: none"> MEM - Mixed Meadow OA - Open Water SWT - Thicket Swamp TAGM5 - Fencerow THD - Deciduous Thicket
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ENBRIDGE GAS INC.

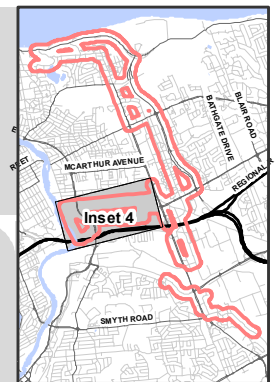
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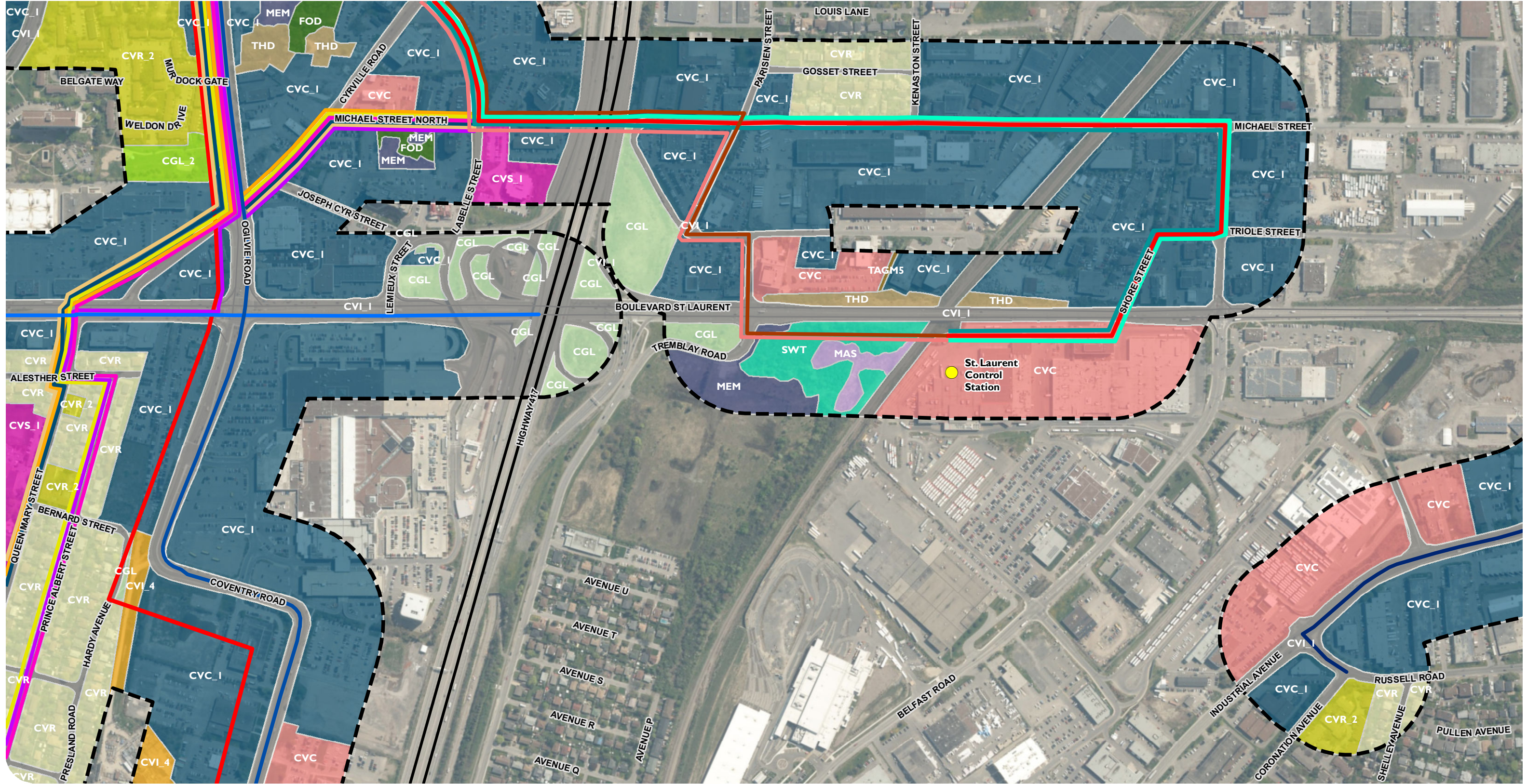


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REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 5 OF 6



<ul style="list-style-type: none"> Control Station Study Area (125 m) Phase 3 Segments Phase 3 IP Segment 2 Phase 3 IP Segment 3 Phase 3 IP Segment 4 	<ul style="list-style-type: none"> Phase 4 Preferred and Alternative Routes Phase 4 XHP Preferred Route Phase 4 XHP East-West Alternative 1 Phase 4 XHP East-West Alternative 2 Phase 4 XHP East-West Alternative 3A Phase 4 XHP East-West Alternative 3B Phase 4 XHP East-West Alternative 4A Phase 4 XHP East-West Alternative 4B Phase 4 XHP North-South Alternative 1 Phase 4 XHP North-South Alternative 2 	<ul style="list-style-type: none"> Phase 4 XHP North-South Alternative 3 Phase 4 XHP North-South Alternative 4 	<ul style="list-style-type: none"> Ecological Land Classification CGL - Greenlands CGL_2 - Parkland CVC - Commercial and Institutional CVC_I - Business Sector CVI_1 - Transportation CVI_4 - Power Generation CVR - Residential CVR_2 - High Density Residential CVS_1 - Education FOD - Deciduous Forest MAS - Shallow Marsh MEM - Mixed Meadow SWT - Thicket Swamp TAGMS - Fencerow THD - Deciduous Thicket
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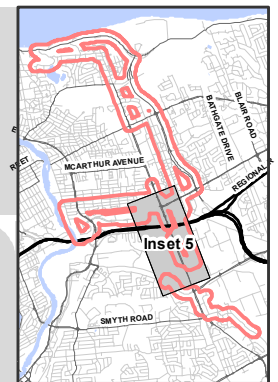


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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

ECOLOGICAL LAND CLASSIFICATION
FIGURE 11
MAP 6 OF 6



- Control Station
- Watercourse
- Study Area (125 m)
- Phase 3 Segments
- Phase 3 IP Segment 4

- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
 - Phase 4 XHP North-South Alternative 1
 - Phase 4 XHP North-South Alternative 2

- Ecological Land Classification**
- CGL - Greenlands
 - CGL_2 - Parkland
 - CGL_4 - Recreational
 - CVC - Commercial and Institutional
 - CVC_1 - Business Sector

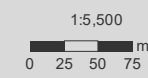
- CVC_1 - Transportation
- CVC_4 - Power Generation
- CVR - Residential
- CVR_2 - High Density Residential
- FOD - Deciduous Forest
- MEG - Graminoid meadow

- MEM - Mixed Meadow
- TAGM5 - Fencerow
- THD - Deciduous Thicket



MAP DRAWING INFORMATION:
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ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

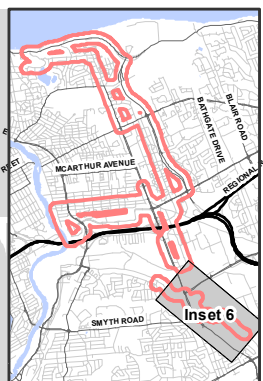


PROJECT: 19-1850

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STATUS: FINAL

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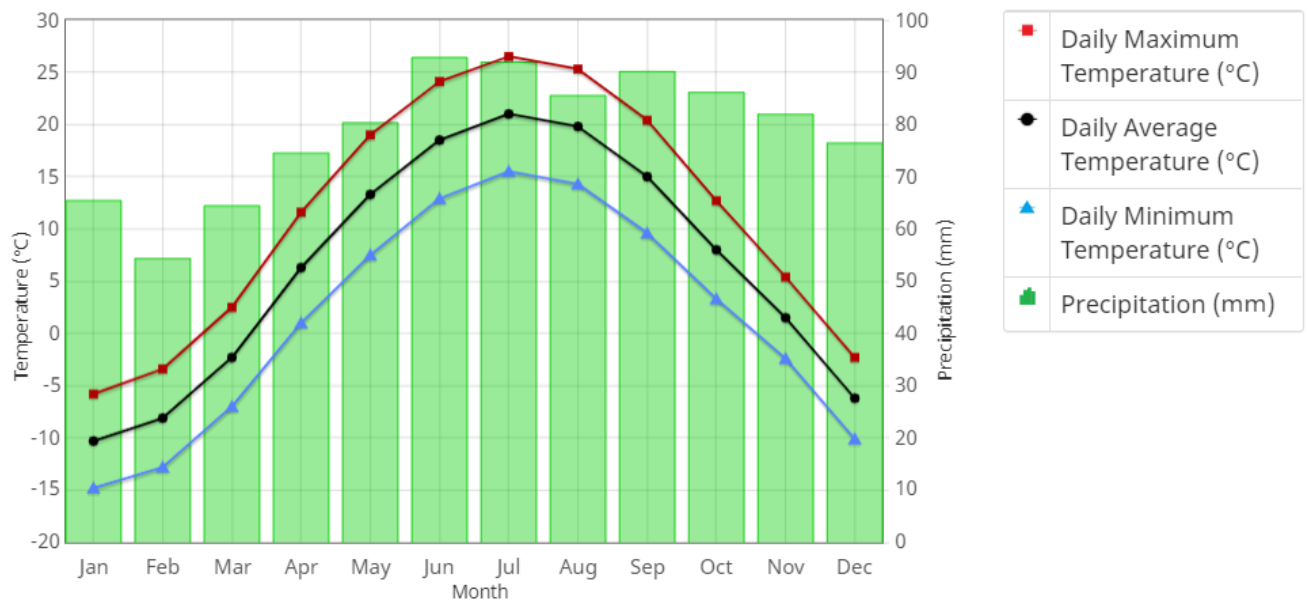
5.2.1 Atmospheric Environment

5.2.1.1 Climate

Climate averages are commonly used to describe the climatic conditions of a particular location in Canada. At the end of each decade, ECCC updates its climate averages for several locations across Canada and for as many climatic characteristics as possible. The climate averages and extremes are obtained from Canadian climate stations with at least 15 years of data between 1981 and 2010 (ECCC 2019).

Figure 12 shows temperature and precipitation data averaged over the period from 1981 to 2010, taken at the Ottawa MacDonald-Cartier International Airport, approximately 10 km southwest of the Study Area.

Figure 12: Temperature and Precipitation Graph for 1981 to 2010 –Ottawa MacDonald-Cartier International Airport



Source: ECCC 2019

5.2.1.2 Air Quality

According to the MECP, overall air quality in Ontario has improved significantly over the past decade due to a substantial decrease in harmful pollutants such as nitrogen dioxide, sulphur dioxide and carbon monoxide that are emitted by vehicles and industry.

There has also been a significant decrease in fine particulate matter which is emitted directly into the atmosphere as a by-product of fuel combustion or formed indirectly in the atmosphere through chemical reactions. Fine particulate matter, including smoke, fumes and dust can have various negative health effects, especially on the respiratory system (Ontario Ministry of the Environment and Climate Change 2015).

5.2.2 Aquatic Environment

A combination of desktop review of available agency resources and preliminary field investigations were conducted to determine the location of existing surface water features and the potential for fish habitat within the Study Area. Preliminary field assessments were completed on December 13 and 17, 2019 to confirm the location of surface water features within the Study Area. Locations of features identified during preliminary field investigations are shown on **Figure 10**.

5.2.2.1 Surface Water

The Project is located within the Rideau Watershed, managed by the RVCA, which consists of six subwatersheds that cover an area of 4,234 square kilometers from the Ottawa River in the north to Wolfe Lake and Upper Rideau Lake in the south, through the townships and communities of Manotick, North Gower, Smiths Falls, Merrickville, Perth, and Westport. The Study Area is located within the Rideau River – Rideau Falls, Ottawa East-A, Cyrville Drain, and Ottawa Drain catchments within the Lower Rideau River and Ottawa River East subwatersheds.

Surface water features in the Study Area are shown on **Figure 10** and consist of McKay Lake, Ottawa River, Rideau River, three small storm water management ponds, and five small streams that are directly or indirectly influenced by the urban landscape and coincide with engineered drainage infrastructure.

McKay Lake (formerly called Hemlock Lake) is a natural spring-fed lake within the Study Area boundaries of Phase 3 IP Segment 1. During high precipitation events, McKay Lake flows north via Unnamed Watercourse 1, eventually discharging into the Ottawa River (Rockcliffe Park Residents Association 2018). Based on preliminary field investigations, connectivity to the unnamed watercourse is ephemeral in nature. McKay Lake is shown on **Figure 10** (Map 1).

The Ottawa River occurs within the northern portion of the Study Area associated with the Phase 4 XHP Preferred Route along Sir George-Étienne Cartier Parkway. The Rideau River occurs within the western portion of the Study Area and is associated with the Phase 4 XHP Preferred Route and the Phase 4 XHP East-West Alternatives. The Ottawa River and Rideau River are not located within the Project footprint (i.e., within 30 m of the routes). The Ottawa River and Rideau River are shown on **Figure 10** (Maps 1 and 4, respectively).

The storm water management ponds occur within the central portion of the Study Area along the south side of Highway 417, north of the off-ramp to Riverside Drive and within the eastbound Vanier Parkway on-ramp loop to Highway 417.

A total of five unnamed watercourses occur within the Study Area and are characterized as small streams or drains within the Ottawa River East subwatershed. The locations of the watercourses are shown on **Figure 10** and described below.

- **Unnamed Watercourse 1:** Flows north across Hillsdale Road through a woodland ravine until reaching a City of Ottawa sewer grate inlet. The sewer system travels north until discharging into the Ottawa River. This stream occurs within the Study Area of Phase 3 IP Segment 1, Phase 4 XHP North-South Alternatives 1 to 4, and the Phase 4 XHP Preferred Route. Unnamed Watercourse 1 is shown on **Figure 10** (Map 1).
- **Unnamed Watercourse 2:** Flows north from Hemlock Road and runs parallel with Aviation Parkway and Sir George-Étienne Cartier Parkway north until it crosses Sir George-Étienne Cartier Parkway near an NCC parking lot and continues north until discharging into the Ottawa River. This stream occurs within the Study Area of Phase 3 IP Segment 1, Phase 4 XHP North-South Alternatives 1 to 4, the Phase 4 XHP Preferred Route, and the Phase 4 XHP Preferred Route NPS 4-inch Segments (St. Laurent Boulevard and Hemlock Road). Unnamed Watercourse 2 is shown on **Figure 10** (Maps 1 and 2).
- **Unnamed Watercourse 3:** Flows north and crosses Hemlock Road and then crosses Aviation Parkway south of and nearby the intersection of Aviation Parkway and Sir George-Étienne Cartier Parkway where it joins Unnamed Stream 2. This stream only occurs within the Study Area of the Phase 4 XHP Preferred Route. Unnamed Watercourse 3 is shown on **Figure 10** (Map 2).

- **Unnamed Watercourse 4:** Flows southwest of Aviation Parkway towards the intersection of Ogilvie Road and Matheson Road and beneath Ogilvie Road via City of Ottawa underground drainage and through residential and industrial areas until discharging into Green's Creek. This stream occurs within the Study Area of the Phase 4 XHP Preferred Route. Unnamed Watercourse 4 is shown on **Figure 10** (Map 3).
- **Unnamed Watercourse 5:** Flows south from an unevaluated wetland located in Ken Steele Park and crosses Ogilvie Road and continues south through natural areas until discharging into Green's Creek. This stream occurs within the Study Area of the Phase 4 XHP Preferred Route. Unnamed Watercourse 5 is shown on **Figure 10** (Map 3).

5.2.2.2

Fish and Fish Habitat

Based on a review of available Aquatic Resource Area data from the MNRF and available information from the RVCA, watercourses and waterbodies that transect the Study Area have thermal regimes characterized as warm (Ottawa River), warm/cool (Rideau River – Rideau Falls catchment [Rideau River]), cool (McKay Lake; based on spring-fed nature) and are known to contain numerous common fish species.

Based on a review of the MNRF LIO Natural Heritage Area mapping (MNRF 2020) and Aquatic Resource Area data, two aquatic SAR listed provincially and federally may potentially occur in the Ottawa River and include: American Eel (*Anguilla rostrata*) and Lake Sturgeon (Great Lakes – Upper St. Lawrence River population) (*Acipenser fulvescens*). A review of MNRF Aquatic Resource Area data identified one additional provincially-listed species associated with the Ottawa River, Northern Sunfish (Great Lakes – Upper St. Lawrence population) (*Lepomis peltastes*), listed as Special Concern.

A review of the DFO Online Aquatic SAR Mapping Tool (DFO 2019) identified one SAR listed provincially and federally for this area of the Ottawa River: Hickorynut (*Obovaria olivaria*). Additionally, three species listed as Special Concern provincially and federally in association with the Ottawa River and Unnamed Watercourses 1, 2 and 3 may have the potential to occur, and include: Channel Darter (St. Lawrence River population) (*Percina copelandi*), Northern Brook Lamprey (*Ichthyomyzon fossor*), and River Redhorse (*Moxostoma carinatum*).

The background review did not identify any fish records for McKay Lake or the storm water management ponds, however, these waterbodies likely provide fish habitat for several common fish species.

A notice of study commencement letter was sent to the RVCA on February 13, 2020. The letter included a request for information regarding the potential for environmentally sensitive areas, floodplains, and distinctive natural features that would warrant protection in the Project Study Area. No response has been received to date.

Detailed aquatic habitat assessments of the unnamed watercourses and the storm water management ponds will be conducted in summer 2020 to further determine connectivity and the potential for and quality of fish habitat in the Study Area. Information gathered from these assessments will help determine potential habitat presence for aquatic SAR.

5.2.3 Wetlands

A desktop review of available agency mapping confirmed there are no Provincially Significant Wetlands within the Study Area; however, a total of 11 agency mapped unevaluated wetlands were identified within the Study Area. Wetlands identified in and adjacent to the Study are shown on **Figure 10**.

Preliminary field investigations conducted in December 2019 confirmed the presence of 13 unevaluated wetlands, 10 of which were agency mapped (two wetlands identified on agency mapping were field-truthed as one contiguous wetland) and an additional three that were unmapped. These additional three wetlands identified during the 2019 preliminary field investigations were located: 1) north of Hemlock Road; 2) southeast of the intersection of Hemlock Road and Aviation Parkway; and, 3) south of Ogilvie Road. The locations of all 13 field-verified wetlands are shown on **Figure 10**, and have been classified using Ontario's Ecological Land Classification System (ELC) (Lee 2008). Unevaluated wetlands included vegetation communities of swamps (SWD, SWT) and marshes (MAMO, MAMM, MASM), where specific community types are further classified and described in **Section 5.2.5, Table 4**.

All 13 wetland communities identified within the Study Area will be further surveyed in summer, 2020. Surveys will include wetland boundary delineation, compiled vascular plant list (where property access permits) and confirmation of wetland community type.

5.2.4 Areas of Natural and Scientific Interest and Other Environmentally Significant Areas

Based on a review of available agency mapping (MNRF 2020), the St. Laurent/Montreal Road Earth Science Area of Natural and Scientific Interest (ANSI) occurs within the Study Area of the Phase 4 Preferred Route, NPS 6-inch Segment (Montreal Road), and Phase 4 XHP North-South Alternatives 1 and 3. This feature covers an area of approximately 0.12 ha and is located along Oasis Private, between St. Laurent Boulevard and Brittany Drive. The extent of this ANSI is shown on **Figure 10**. The site is currently developed with high density residential buildings and businesses and is outside the Project footprint.

5.2.5 Terrestrial Habitat and Vegetation

Preliminary ELC surveys were conducted using the ELC System for Southern Ontario, second approximation classifications (Lee et al. 1998, Lee 2008) to classify and map ecological communities within the Study Area. The ecological community polygon boundaries were determined through a review of aerial photography and further refined during the preliminary field investigations conducted in December 2019. Current ELC mapping is provided on **Figure 11**. As these surveys were completed outside of the growing season and without soil assessment, natural features were only identified to the community class level of the ELC hierarchy. In addition, winter tree surveys were conducted in tandem with the preliminary ELC surveys. Complete and detailed ELC surveys, as well as a vascular plant (botanical) list, will be completed in summer 2020, where property access permits.

Lands within the Project Study Area are predominantly classified as ‘constructed’ communities, with infrequent occurrences of natural/naturalized community types. Large portions of the Study Area are classified as residential (CVR_1 and CVR_2), business (CVC_1), commercial and institutional (CVC), and transportation (CVI_1). Some naturalized community types showed high levels of anthropogenic and industrial influence, and were considered highly disturbed. Community types showing minimal anthropogenic influence were typically associated with NCC lands, overlapping with the Study Area of the Phase 4 XHP Preferred Route. A full list of ELC community types, the number of polygons of each, and their total area within the Study Area is provided in **Table 4**.

Table 4: ELC Communities within the Study Area

ELC Community Code	ELC Community Type	Number of Polygons within Study Area	Combined Area per ELC Type (ha)
CULTURAL			
CGL	Greenlands	58	48.64
CGL_2	Parkland	12	8.23
CGL_4	Recreational	8	3.49
CVC	Commercial and Institutional	27	44.30
CVC_1	Business Sector	65	149.19
CVI	Transportation and Utilities	1	0.65
CVI_1	Transportation	18	96.13
CVI_2	Disposal and Recycle	1	0.14
CVI_3	Sewage and Water Treatment	1	0.16
CVI_4	Power Generation	4	2.55
CVR_1	Low Density Residential	85	96.71
CVR_2	High Density Residential	41	64.77
CVS_1	Education	4	5.38
CVS_2	Health	1	3.80
OAGM4	Open Pasture	1	9.58
NATURAL (UPLAND)			
Cliff			
CLT	Treed Cliff	2	0.40
Forest			
FOD	Deciduous Forest	26	29.96
FODM	Dry – Fresh Oak Deciduous Forest	1	4.61
FODM3	Dry – Fresh Poplar – White Birch Deciduous Forest	4	5.01
FODM4-1	Dry – Fresh Beech Deciduous Forest	1	1.81
FODM5-1	Dry – Fresh Sugar Maple Deciduous Forest	3	6.33
FODM12	Naturalized Deciduous Plantation	1	0.28
Woodland			
WOC	Coniferous Woodland	1	0.39
Thicket			
TAGM5	Fencerow	17	3.55
THD	Deciduous Thicket	13	5.14

ELC Community Code	ELC Community Type	Number of Polygons within Study Area	Combined Area per ELC Type (ha)
THDM2-6	Buckthorn Deciduous Shrub Thicket	2	1.49
Meadow			
MEG	Graminoid Meadow	13	47.22
MEM	Mixed Meadow	10	4.97
NATURAL (WETLAND)			
Swamp			
SWD	Deciduous Swamp	2	3.78
SWT	Thicket Swamp	6	6.26
Marsh			
MAMO1-2	Cattail Graminoid Organic Meadow Marsh	1	0.38
MAMM1-3	Reed-canary Grass Graminoid Mineral Marsh	1	0.05
MAS	Shallow Marsh	2	0.61
MASM1-1	Cattail Mineral Shallow Marsh	2	1.59
MASM1-14	Reed Canary Grass Mineral Shallow Marsh	1	0.48
AQUATIC SYSTEM			
OA	Open Water	7	8.92

5.2.6 Wildlife and Wildlife Habitat

A records review of various publicly available wildlife atlases and agency records was completed for a 1 km radius surrounding the Project footprint to compile a list of historical wildlife species occurrences in the Study Area; a total of 251 wildlife species were identified as having potential to occur within the Study Area. The majority of these species are considered common and secure in Ontario. A full list of the wildlife species can be found in **Appendix L**.

5.2.6.1 Incidental Wildlife Observations

Incidental wildlife observations recorded during the preliminary field investigations conducted in December 2019 included live wildlife observations and indirect wildlife evidence (i.e., scat, tracks, feeding sites, road kill, dens, and dams).

In total, three (3) bird species (American Crow [*Corvus brachyrhynchos*], Black-capped Chickadee [*Poecile atricapillus*], White-breasted Nuthatch [*Sitta carolinensis*]) and one mammal (Eastern Gray Squirrel [*Sciurus carolinensis*]) were observed during the field investigation. All of these species are considered common in Ontario.

5.2.6.2 Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle, and areas that are important to migratory and non-migratory species (MNR 2000). To assist planning authorities, the MNRF developed the Significant Wildlife Habitat (SWH) Technical Guide (MNR 2000) that provides information on the identification, description, and prioritization of SWH in Ontario. To account for the ecological diversity across the province, MNRF developed the SWH Ecoregional Criteria Schedules to support the SWH Technical Guide. These schedules are specific to each geographic area of each eco-region. The Study Area is located in Ecoregion 6E (Lake Simcoe-Rideau); under the Criteria Schedule for Ecoregion 6E (MNRF 2015), SWH has been divided into four broad categories consisting of:

- Seasonal concentration areas;
- Rare vegetation communities or specialized habitats for wildlife;
- Animal movement corridors; and,
- Habitats of species of conservation concern excluding the habitats of endangered and threatened species.

The Study Area is located on both provincial and federal lands. As the application of the Ecoregional Criteria generally pertains to lands under provincial jurisdiction, candidate SWH (cSWH) has been identified and delineated in the Study Area for the sections of pipeline overlapping with provincial lands. For the portions of Study Area overlapping with federal lands, candidate Wildlife Habitat (cWH) has been identified and delineated in consideration of the Ecoregional Criteria for 6E, where applicable.

Wildlife habitat has been preliminarily identified within the Study Area through the initial site assessment and ELC mapping (December 2019). Areas identified as potentially supporting wildlife and wildlife habitat have been identified as “cSWH” and “cWH”, and are predominantly associated with the woodlands, meadows, wetlands and

watercourses/waterbodies that overlap with the Study Area, as shown on **Figure 11**. Vegetation community types described in the following four broad categories are outlined in **Table 4**, above.

1. Seasonal Concentration Areas

Seasonal concentration areas are sites that support large numbers of a species to gather together at one time of the year, or where several species congregate. Based on the initial site investigation conducted in December 2019, three (3) types of seasonal concentration areas have the potential to occur in the Study Area, including: bat maternity habitat, turtle wintering areas, and reptile hibernacula.

- **Bat maternity habitat:** supported by mixed and deciduous forests and swamps with large diameter dead or dying trees with cavities. Areas that have the potential to support bat maternity habitat include treed communities in the Study Area (i.e., FOD, FODM, FODM3, FODM4-1 FODM5-1 and SWD).
- **Turtle wintering areas:** occur in permanent waterbodies and large wetlands with sufficient dissolved oxygen. Areas that have the potential to support turtle wintering in the Study Area include areas of open water (OA) (McKay Lake), deep, permanent watercourses (Ottawa River, Rideau River) and some wetland communities (MAS).
- **Reptile hibernacula:** may be found in/under rock piles, slopes, stone fences or crumbling foundations. Areas in the Study Area that may have the potential to support reptile hibernacula include areas of open/exposed rock faces (CLT), as well as undisturbed and naturalized community types.

2. Rare Vegetation Communities or Specialized Habitats

This category consists of two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. S-Ranks are rarity rankings applied to species at the provincial level. Generally, S-Ranks of S1 to S3 (i.e., extremely rare to rare-uncommon in Ontario), as defined by the NHIC, could qualify. Specialized habitats are microhabitats that are critical to some wildlife species. Based on the initial site investigation conducted in December 2019, one (1) specialized habitat has the potential to occur in the Study Area: amphibian breeding habitat (wetland).

- **Amphibian breeding habitat:** suitable cSWH/cWH for this specialized habitat type includes wetland areas that were likely to support vernal (seasonal) pooling, and included shallow marsh (MAS), and swamp (SWT and SWD) communities.

3. Animal Movement Corridors

Animal movement corridors are elongated, naturally-vegetated parts of the landscape used by animals to move from one habitat to another. Based on the initial site visit conducted in December 2019, areas that may support cSWH/cWH for animal movement corridors were not identified.

4. Habitat for Species of Conservation Concern

The SWH Technical Guide (MNR 2000) defines Species of Conservation Concern (SCC) as globally, nationally, provincially, regionally, or locally rare (S-Rank of S1, S2 or S3) but does not include SAR (species listed as Threatened or Endangered; species identified as provincially and/or federally-listed SAR are further defined and discussed in **Section 5.2.7**). SCC include the following:

- Species that are assigned a conservation rank of S1-S3 by the NHIC;
- Species that are listed as Special Concern on the Species at Risk in Ontario (SARO) list;
- Species that are listed as Special Concern, Threatened, or Endangered on Schedule 1 of SARA; and/or,
- Species that are classified as Special Concern, Threatened, or Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but have not yet been added to Schedule 1 of SARA.

Based on the results of the preliminary field investigation, a total of 13 SCC were identified as having the potential to occur in the Study Area; species names, status, and general habitat descriptions are provided in **Table 5**. This list was derived from the species background review (detailed above) provided in **Appendix L**. Consideration of SCC habitat potentially present in the Study Area (**Table 7**) was determined based on the general habitat requirements of the species and the ELC communities identified during the preliminary field investigation conducted in December 2019. Spring and summer field surveys (2020) will be completed, where identification of SCC and associated habitat will be characterized and mapped, where appropriate.

The area surrounding the Study Area is highly developed and disturbed, as the Study Area occurs within the urban area of the City of Ottawa. Natural features in the Study Area exist as isolated and highly impacted patches, dominated by invasive species and surrounded by urban infrastructure. SCC that are listed in **Appendix L** but not included in **Table 5** are considered unlikely to be present, as their habitat is considered absent from the Study Area based on the results of the December 2019 field investigation.

Table 5: Species of Conservation Concern with Potential to Occur in the Study Area

Notes:

- 1 SARA (SC = Special Concern)
- 2 Ontario Endangered Species Act, 2007 (SC = Special Concern)
- 3 Ontario S-Rank (S4= apparently secure; S3 = vulnerable; S2 = imperilled; B = breeding status; N = non-breeding status)
- 4 Information sources include: CBC = Christmas Bird Count; DFO = Fisheries and Oceans Canada; NHIC= Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas; OBA= Ontario Butterfly Atlas

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
BIRDS						
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	---	SC	S4B	CBC	The species inhabits coniferous or mixed forests; deciduous tree stands; parks, orchards. This species may occur in the forest and woodland (FOD and WOC) communities in the Study Area.
<i>Contopus virens</i>	Eastern Wood-pewee	SC	SC	S4B	OBBA	The species inhabits open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearing, edges; farm woodlots, parks. This species may occur in the forest (FOD) communities in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Euphagus carolinus</i>	Rusty Blackbird	SC	SC	S4B	CBC	The species inhabits openings in coniferous woodlands bordering bodies of water; tree-bordered marshes, beaver ponds, muskegs, bogs, fens or wooded swamps; stream borders with alder, willow; wooded island on lakes. This species may occur in the forest, woodland, and swamp (FOD, WOC and SWD) communities in the Study Area.
<i>Falco peregrinus</i>	Peregrine Falcon	SC	SC	S3B	CBC, OBBA	The species uses tall buildings in urban centres for nesting. Multiple tall buildings that could be used for nesting are present within CVC and CVR communities within the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
HERPTILES						
<i>Chelydra serpentina</i>	Snapping Turtle	SC	SC	S3	NHIC, MECP	The species inhabits 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 is approximately 28 ha. This species may occur in the open aquatic and wetland (OA, SWM, MAS) communities, as well as the streams in the Study Area.
<i>Graptemys geographica</i>	Northern Map Turtle	SC	SC	S3	MECP	The species inhabits rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, the turtles hibernate on the bottom of deep, slow-moving sections of river. They require high-quality water that supports the female's mollusc prey. This species may occur in the open aquatic (OA) communities such as the Ottawa River or the Rideau River in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Thamnophis sauritus</i>	Eastern Ribbonsnake (Great Lakes population)	SC	SC	S3	MECP	The species inhabits sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups. As this species uses a combination of habitats, it may occur within or adjacent to features such as the unnamed watercourses (and nearby natural features), the wetland communities (MAS, MASM1-1, MAMM1-2, MASM1-14) and McKay Lake within the Study Area.
LEPIDOPTERA						
<i>Danaus plexippus</i>	Monarch	SC	SC	S2N, S4B	OBA	The species uses meadows and open areas where Milkweed plants are present for caterpillars to feed on. The CGL, CVC, CVI, MEM, MEG communities may provide such habitat.
FISH						

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (Great Lakes - Upper St. Lawrence populations)	SC	SC	S3	DFO	The species inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel. This species may occur in the open aquatic (OA) communities such as the Ottawa River or the Rideau River in the Study Area.
<i>Lepomis peltastes</i>	Northern Sunfish (Great Lakes – Upper St. Lawrence population)	---	SC	S3	ARA	The species lives in shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds, with sandy banks or rocky bottoms. Northern Sunfish prefer to be near aquatic vegetation where they can avoid strong currents. This species may occur in the open aquatic (OA) communities such as the Ottawa River or the Rideau River as well as the unnamed watercourses in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Moxostoma carinatum</i>	River Redhorse	SC	SC	S2	DFO	The species inhabits medium to large-size rivers that have substantial flows. In May and June, adults migrate from deeper, slower moving pools and run habitats to shallow riffle-run habitats having coarse substrate and moderate to swift flow. This species may occur in the open aquatic (OA) communities such as the Ottawa River or the Rideau River in the Study Area.
<i>Percina copelandi</i>	Channel Darter (St. Lawrence Population)	SC	SC	S2	DFO	The species lives in clean streams and lakes with sandy or gravel bottoms. During the breeding season in late spring, it prefers riffle areas with fairly fast-moving water but spends the winter in deeper, calmer water. It eats mostly aquatic insect larvae from the bottom of the stream. This species may occur in the open aquatic (OA) communities such McKay Lake or the unnamed watercourses in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
VASCULAR PLANTS						
<i>Pterospora andromedea</i>	Woodland Pinedrops	---	---	S2	NHIC	The species is found in coniferous or mixed hardwood coniferous forests. This species may occur in the coniferous woodland (WOC) or forest (FOD) communities in the Study Area.

5.2.7 Species at Risk

5.2.7.1 Regulatory Context

Federal

The federal *SARA* applies to species listed under Schedule 1 of the Act on federal lands and/or aquatic species, as well as migratory birds listed under the *Migratory Birds Convention Act, 1994*. Under *SARA*, species listed on Schedule 1 receive species protection (Section 32) and habitat protection (Section 33). Critical Habitat is defined under Section 2 of *SARA* as “the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species”.

The portions of the Project occurring on federal lands (i.e., NCC land within the footprint of the Phase 4 XHP Preferred Route and minor portions of the Phase 4 XHP North-South Alternatives 1 to 4 along Sir George-Étienne Cartier Parkway and Aviation Parkway) are subject to review by a federal authority, pursuant to Section 67 of *CEAA, 2012* (see **Section 1.4.2**).

Provincial

The provincial *Endangered Species Act, 2007* applies to species listed as Extirpated, Endangered, or Threatened under *Ontario Regulation 230/08* on private lands and public lands under provincial jurisdiction, and provides both species protection (Section 9) and habitat protection (Section 10). Under the Act, habitat is defined as either General Habitat or Regulated Habitat. General Habitat is defined as the area a species currently depends on, either directly or indirectly, to carry out its life processes (under clause 2(1)(b) of the Act), including: dens, nests, hibernacula, or other residences.

General Habitat does not include areas where a species once lived and/or where it may be re-introduced. General Habitat protection is in place until a regulation is made prescribing an area as Regulated Habitat. Regulated Habitat is the area prescribed for a species in a habitat regulation (under clause 2(1)(a) of the Act), and may include: specific features/boundaries and areas where the species lives, used to live, or is believed to be capable of living.

5.2.7.2 Potential for Species at Risk in the Study Area

Based on the results of the preliminary field investigation, a total of 17 federally and/or provincially-listed SAR were identified to have the potential to occur in the Study Area; species names, status, and general habitat descriptions are provided in **Table 6**. This list was derived from the species background review detailed in **Section 5.2.6** and provided in **Appendix L**. Consideration of potential SAR/SAR habitat that may be present in the Study Area (**Table 6**) was determined based on the general habitat requirements of the species and the ELC communities identified during the preliminary field investigation conducted in December, 2019. The Study Area is highly developed and disturbed, as it occurs within the urban area of the City of Ottawa. As such, potential presence of SAR may be less likely than other wildlife species. More detailed surveys targeting potential SAR and their habitat will be conducted in spring/summer of 2020.

Table 6: Federal and Provincial Species at Risk with Potential to Occur in the Study Area

Notes:

1. SARA (THR= Threatened, END = Endangered)
2. Ontario Endangered Species Act, 2007 (THR= Threatened, END= Endangered, SC = Special Concern)
3. Ontario S-Rank (S4= apparently secure; S3 = vulnerable; S2 = imperilled; S1 = critically imperilled; ? = inexact or uncertain; B = breeding status; N = non-breeding status)
4. Information sources include: CBC = Christmas Bird Count; MECP = Ministry of Environment, Conservation and Parks; MWH = Mammals of the Western Hemisphere; NHIC= Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
BIRDS						
<i>Cardellina canadensis</i>	Canada Warbler	THR	SC	S4B	OBBA	The species requires interior forest habitat; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat usually requires at least 30 ha. Potential habitat may occur in the forest (FOD) communities in the Study Area.
<i>Chaetura pelagica</i>	Chimney Swift	THR	THR	S4B, S4N	NHIC, OBBA	The species typically nests in uncapped, open-topped chimneys which may be present in older buildings within urban areas, which may be present in the CVC and/or CVR communities.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Chordeiles minor</i>	Common Nighthawk	THR	SC	S4B	OBBA	The species typically nests in areas containing open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. Potential habitat may occur in the commercial and institutional (CVC) and business sector (CVC_1) communities in the Study Area where there are flat gravel roofs.
<i>Dolichonyx oryzivorus</i>	Bobolink	THR	THR	S4B	NHIC, OBBA	The species requires large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland generally > 50 ha. Potential habitat may occur in the graminoid meadow (MEG) communities in the Study Area.
<i>Hirundo rustica</i>	Barn Swallow	THR	THR	S4B	OBBA	The species typically constructs nests on anthropogenic structures with rough surfaces and horizontal ledges, which may be present in the CGL, CVC, CVR, and/or CVI communities, and typically are located near open water areas or meadow areas which are used for foraging, and which are provided by the OA and graminoid meadow (MEG) communities in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Hylocichia mustelina</i>	Wood Thrush	END	SC	S4B	CBC, OBBA	The species is found in Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near ponds or swamps; hardwood forest edges; must have some trees higher than 12 m. Potential habitat may occur in the forest (FOD) communities in the Study Area.
<i>Sturnella magna</i>	Eastern Meadowlark	THR	THR	S4B	OBBA	The species inhabits 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 generally >10 ha in size. Potential habitat may occur in the graminoid meadow (MEG) communities in the Study Area.
HERPTILES						
<i>Emydoidea blandingii</i>	Blanding's Turtle	THR	THR	S3	NHIC, MECP	The species typically inhabits 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 habitat; hibernates in bogs; not readily observed. Potential habitat may occur in the shallow marsh (MAS, MASM1-1, MASM1-14) communities in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Pseudacris triseriata</i> pop. 1	Western Chorus Frog (Great Lakes/St. Lawrence - Canadian Shield Population)	THR	---	S3	MECP	The species requires both terrestrial and aquatic habitats in close proximity. Terrestrial habitat consists mostly of humid prairie, moist woods, or meadows. For reproduction and tadpole development, this species requires seasonally dry, temporary ponds that are devoid of predators such as fish. Potential habitat may occur in the wetland (MAMM1-3, SWD, SWT) and meadow (MEG) communities in the Study Area that contain ephemeral pooling/ponding ideal for breeding.
FISH						
<i>Anguilla rostrata</i>	American Eel	--	END	S1?	NHIC	The species inhabits both salt and freshwater environments in areas of open water. Potential habitat may occur in the open aquatic (OA) communities associated with the Ottawa River in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Acipenser fulvescens</i> pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	---	END	S2	NHIC	This species inhabits larger rivers and lakes, with soft bottoms of mud, sand, or gravel. They are usually found at depths of 5 m to 20 m. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents. Potential habitat may occur in the open aquatic (OA) communities associated with the Ottawa River in the Study Area.
MAMMALS						
<i>Myotis leibii</i>	Eastern Small-footed Myotis	---	END	S2S3	MWH	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. Potential habitat may occur in the treed communities (forest [FOD], swamp [SWD], woodland [WOC], fencerow [TAGM5]) in the Study Area.

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
<i>Myotis lucifugus</i>	Little Brown Myotis	END	END	S4	MWH	The species 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. Potential habitat may occur in the treed communities (forest [FOD], swamp [SWD], woodland [WOC], fencerow [TAGM5]) in the Study Area.
<i>Myotis septentrionalis</i>	Northern Myotis	END	END	S3	MWH	The species 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, man-made structures but prefers hollow trees or under loose bark; hunts within forests, below canopy. Potential habitat may occur in the treed communities (forest [FOD], swamp [SWD], woodland [WOC], fencerow [TAGM5]) in the Study Area.
<i>Pipistrellus subflavus</i>	Tri-colored Bat	END	END	S3?	MWH	The species can be found in a variety of forested habitats. They form day roosts and maternity colonies in older forests and occasionally in barns or other structures, and overwinter in caves. They forage over water and along streams in the forest. Potential habitat may occur in the treed communities (forest [FOD], swamp [SWD], woodland [WOC], fencerow [TAGM5]) in the Study Area.

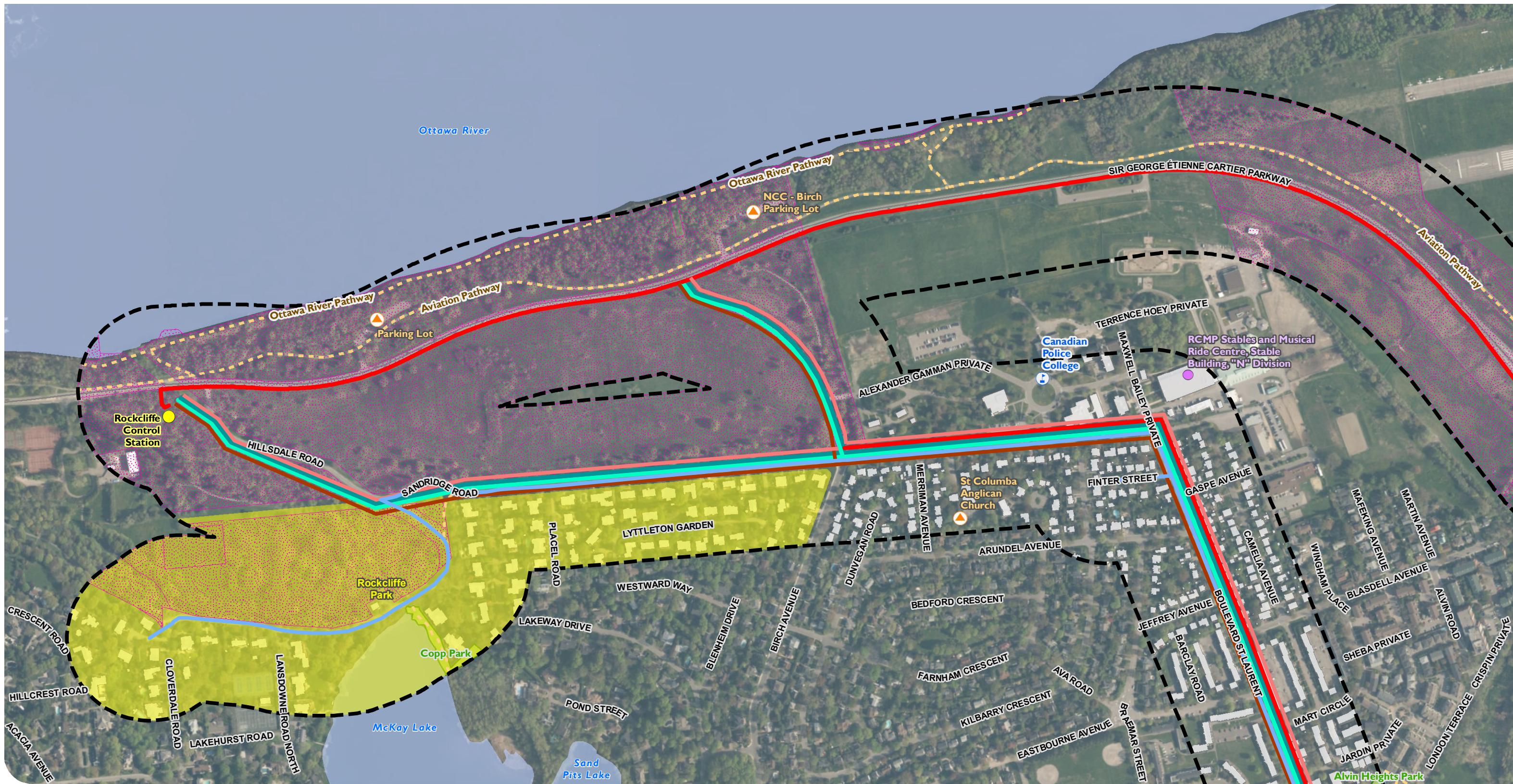
Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴	General Habitat Requirements
VASCULAR PLANTS						
<i>Juglans cinerea</i>	Butternut	END	END	S3?	NHIC	The species usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and 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. Potential habitat may occur in the treed communities (forest [FOD], swamp [SWD], fencerow [TAGM5]) in the Study Area.
<i>Platanthera leucophaea</i>	Eastern Prairie Fringed-orchid	END	END	S2	MECP	The species grows in wetlands, fens, swamps and tallgrass prairie. It has been found in ditches and railroad rights-of-way. Potential habitat may occur in the swamp communities (SWD) in the Study Area.

5.3 Socio-Economic Environment

This subsection provides baseline information on the following components:

- Planning Policies;
- Existing and Planned Land Use;
- Population, Employment, and Economic Activities;
- Human Occupancy and Resource Use;
- Infrastructure and Services;
- Interests of Indigenous Communities; and,
- Archaeological and Cultural Heritage Resources.

Socio-economic features are shown on **Figure 13**.



ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 1 OF 6



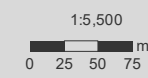
- Control Station
- Study Area (125 m)
- Phase 3 IP Segment 1
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

- 📍 School
- 📍 Cultural Facility
- 📍 Built Heritage
- Path
- NCC Lands
- Heritage Conservation District
- Park / Greenspace
- Building Footprint
- Waterbody



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

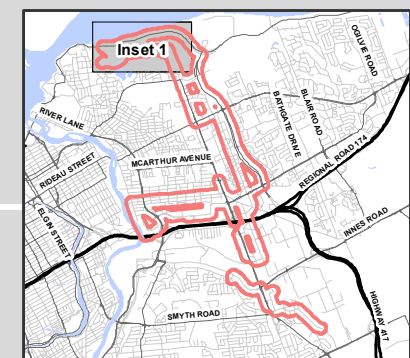


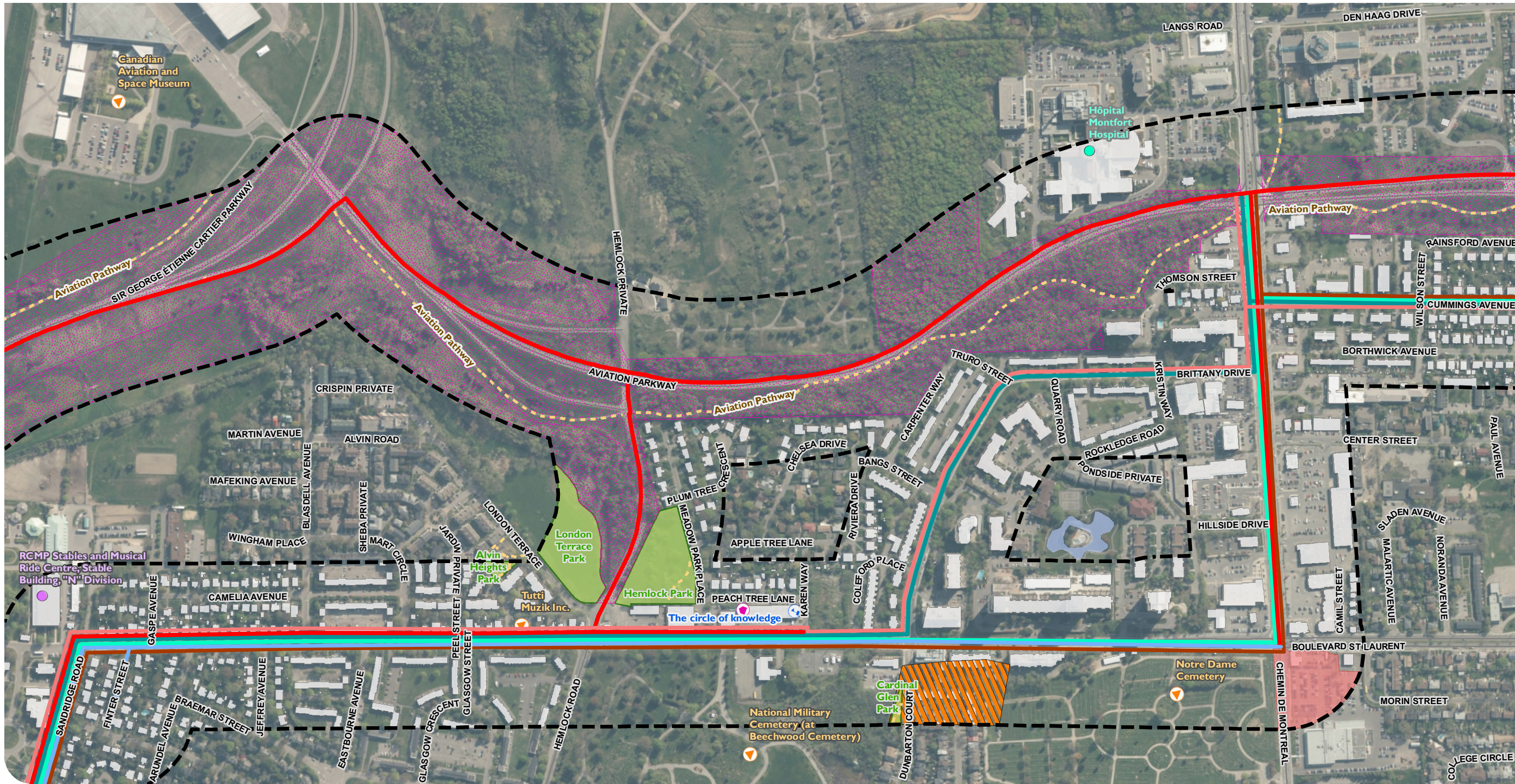
PROJECT: 19-1850

Notes:
- Data has been clipped to study area extent,
with some exceptions
- Routes have been offset for visualization purposes.

STATUS: FINAL

DATE: 2020-06-25





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REPLACEMENT PIPELINE PROJECT

SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 2 OF 6

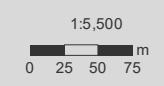


- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 1
- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

- Health Service Location
- School
- Licensed Home Child Care Agency
- Cultural Facility
- Built Heritage
- Path
- NCC Lands
- Park / Greenspace
- Former Landfill
- Business Improvement Area
- Building Footprint
- Waterbody

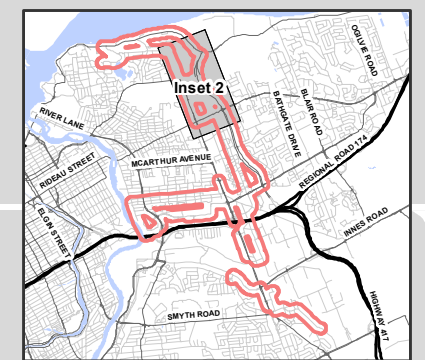


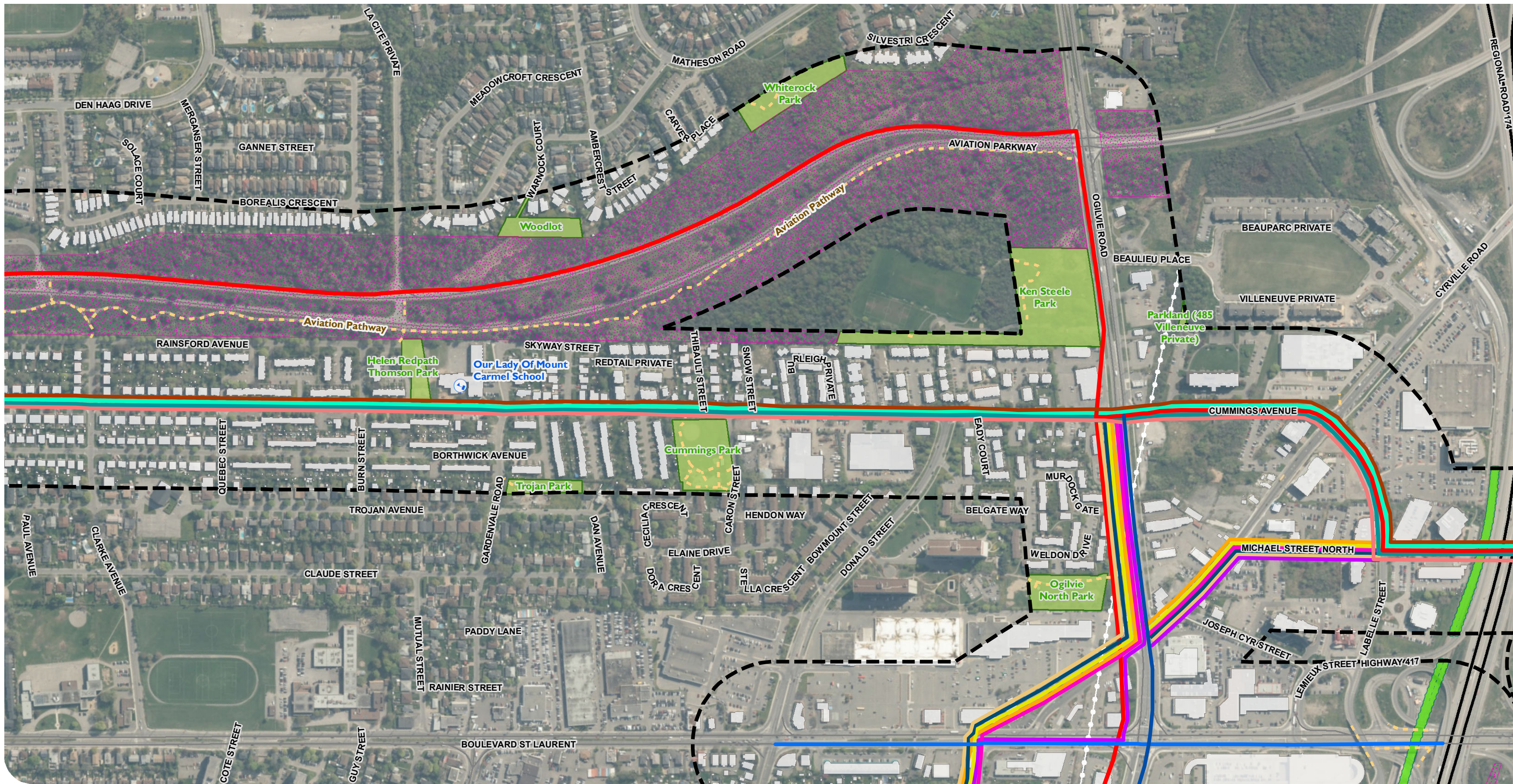
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ENBRIDGE GAS INC.
MAP CREATED BY: LK/SFG
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MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N



Notes:
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with some exceptions
- Routes have been offset for visualization purposes.

PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





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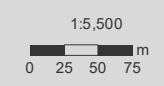
SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 3 OF 6



- | | | | | |
|-------------------------|---|---------------------------------------|----------------------|--------------------|
| Control Station | Phase 4 Preferred and Alternative Routes | Phase 4 XHP North-South Alternative 1 | School | NCC Lands |
| Study Area (125 m) | Phase 4 XHP Preferred Route | Phase 4 XHP North-South Alternative 2 | Hydro Line | Park / Greenspace |
| Phase 3 Segments | Phase 4 XHP East-West Alternative 1 | Phase 4 XHP North-South Alternative 3 | Path | Building Footprint |
| Phase 3 IP Segment 2 | Phase 4 XHP East-West Alternative 2 | Phase 4 XHP North-South Alternative 4 | Stage 1 O Train Line | |
| Phase 3 IP Segment 3 | Phase 4 XHP East-West Alternative 3A | | | |
| | Phase 4 XHP East-West Alternative 3B | | | |
| | Phase 4 XHP East-West Alternative 4A | | | |
| | Phase 4 XHP East-West Alternative 4B | | | |

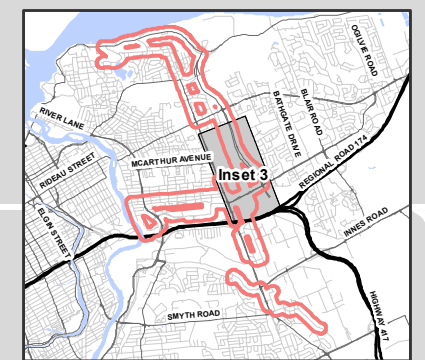


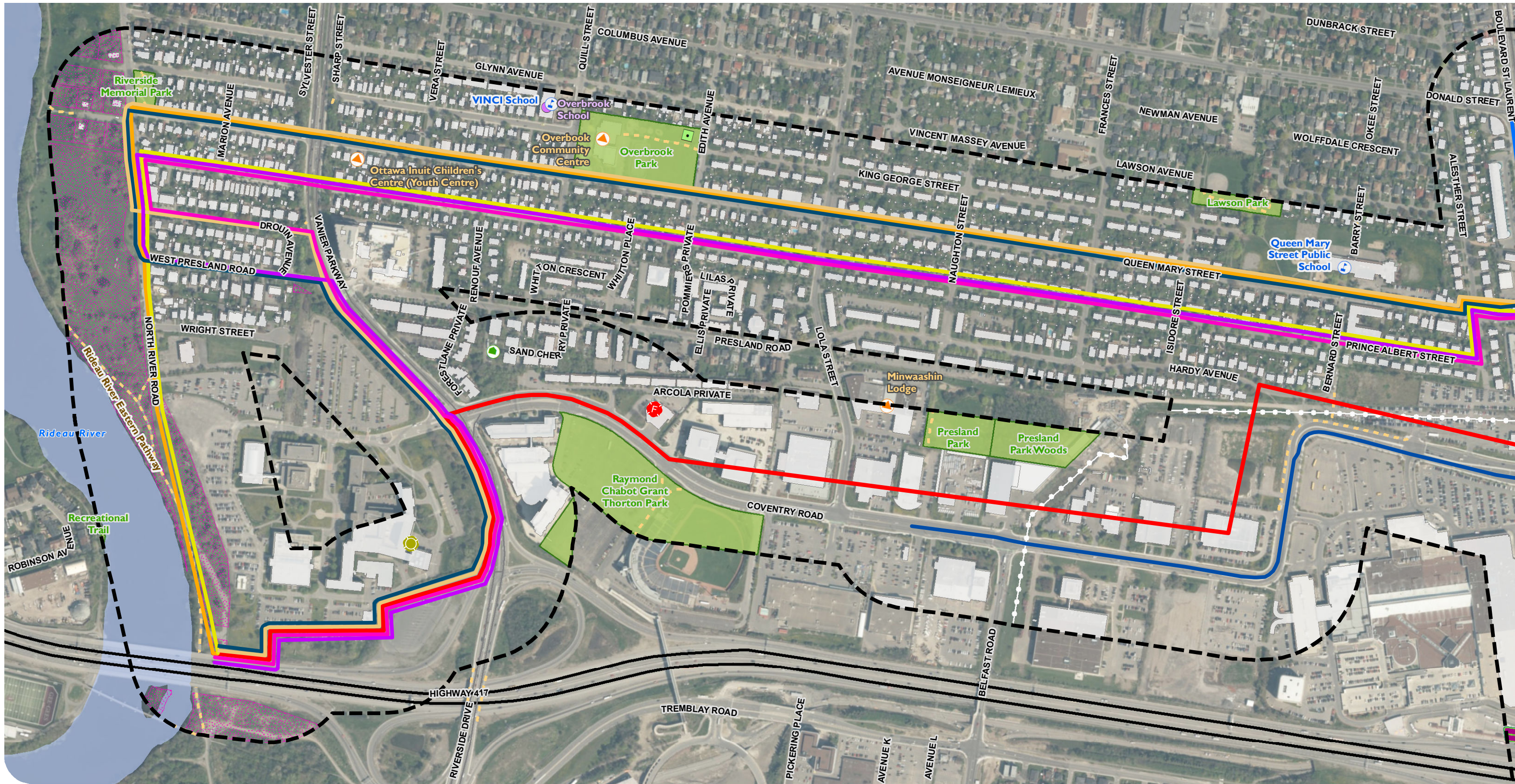
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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 4 OF 6



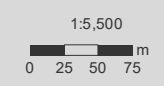
- Control Station
- Study Area (125 m)
- Phase 3 Segments**
 - Phase 3 IP Segment 2
 - Phase 3 IP Segment 3
- Phase 4 Preferred and Alternative Routes**
 - Phase 4 XHP Preferred Route
 - Phase 4 XHP East-West Alternative 1
 - Phase 4 XHP East-West Alternative 2
 - Phase 4 XHP East-West Alternative 3A
 - Phase 4 XHP East-West Alternative 3B
 - Phase 4 XHP East-West Alternative 4A
 - Phase 4 XHP East-West Alternative 4B

- Fire Station
- RCMP
- School
- Residential Services (Domiciliary Hostel)
- Cultural Facility
- Community Garden
- Built Heritage

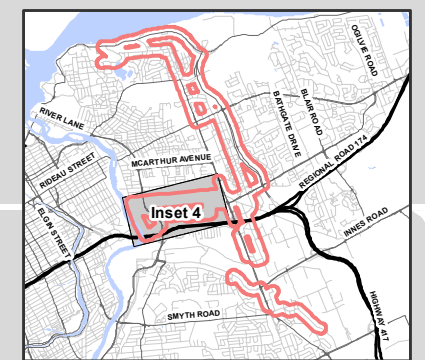
- Hydro Line
- Path
- Stage 1 O Train Station
- Stage 1 O Train Line
- NCC Lands
- Park / Greenspace
- Building Footprint
- Waterbody

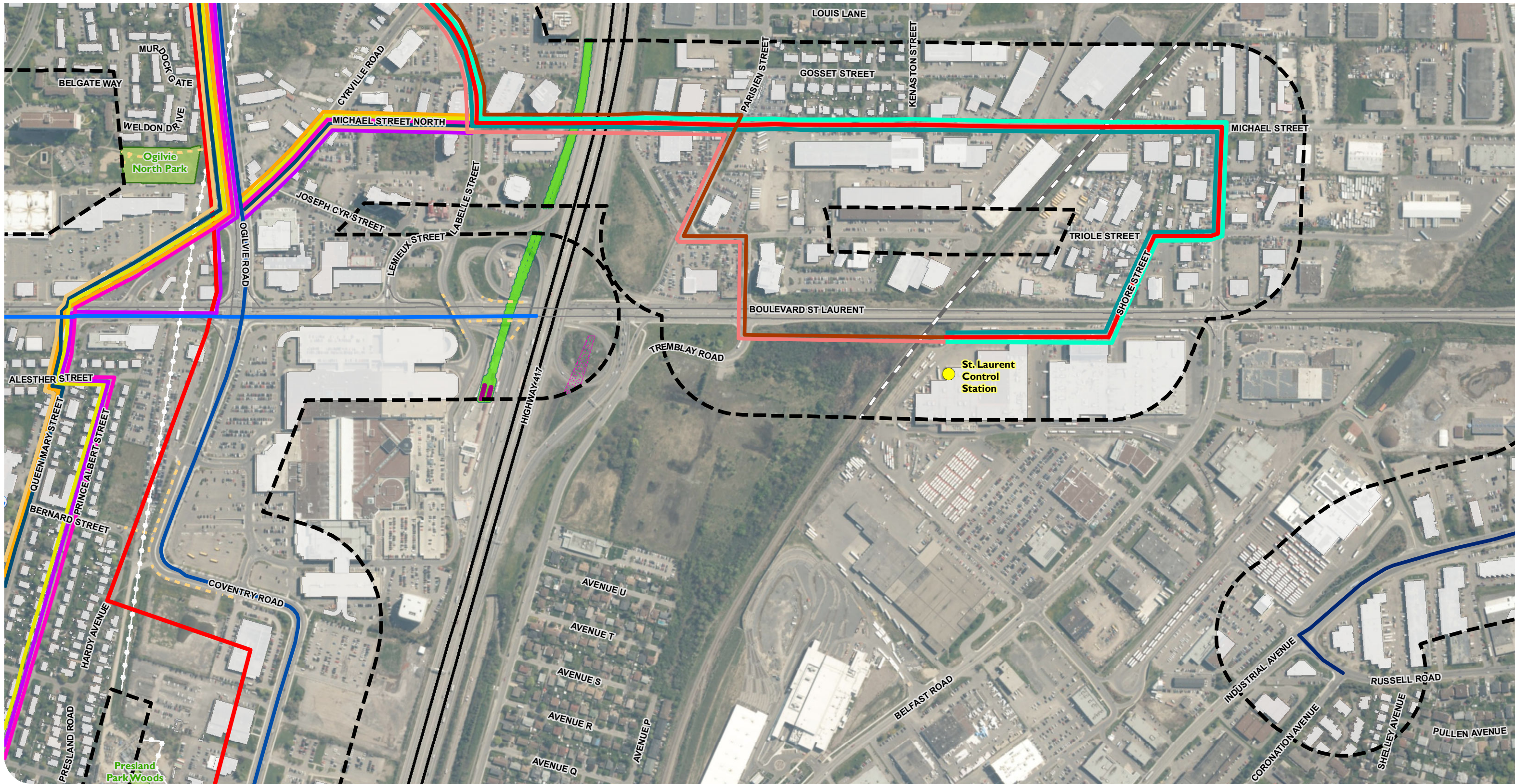


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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 5 OF 6



- Control Station
- Study Area (125 m)
- Phase 3 Segments**
- Phase 3 IP Segment 2
- Phase 3 IP Segment 3
- Phase 3 IP Segment 4

- Phase 4 Preferred and Alternative Routes**
- Phase 4 XHP Preferred Route
 - Phase 4 XHP East-West Alternative 1
 - Phase 4 XHP East-West Alternative 2
 - Phase 4 XHP East-West Alternative 3A
 - Phase 4 XHP East-West Alternative 3B
 - Phase 4 XHP East-West Alternative 4A
 - Phase 4 XHP East-West Alternative 4B

- Phase 4 XHP North-South Alternative 1
- Phase 4 XHP North-South Alternative 2
- Phase 4 XHP North-South Alternative 3
- Phase 4 XHP North-South Alternative 4

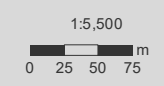
- Ambulance Facility
- School
- Hydro Line
- Railway

- Path
- Stage 1 O Train Station
- Stage 1 O Train Line
- NCC Lands

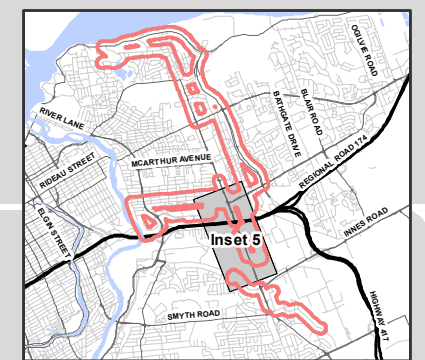
- Park / Greenspace
- Building Footprint



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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

SOCIO-ECONOMIC FEATURES
FIGURE 13
MAP 6 OF 6

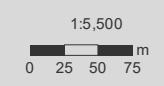


- | | |
|-------------------------|---|
| Control Station | Phase 4 Preferred and Alternative Routes |
| Study Area (125 m) | Phase 4 XHP Preferred Route |
| Phase 3 Segments | Phase 4 XHP North-South Alternative 1 |
| Phase 3 IP Segment 4 | Phase 4 XHP North-South Alternative 2 |

- | | |
|--------------------|--------------------|
| Ambulance Facility | Railway |
| Cultural Facility | Path |
| Community Garden | Park / Greenspace |
| Hydro Line | Building Footprint |

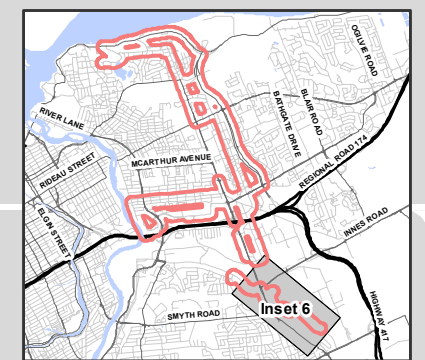


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PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25



5.3.1 Planning Policies

Municipalities are the primary decision-makers for their communities and are required to implement provincial policies through municipal official plans and planning-related decisions.

Plans and policies reviewed as part of the Project include:

- Provincial Policy Statement, 2020 (MMAH 2020); and,
- City of Ottawa Official Plan (City of Ottawa 2003).

5.3.1.1 Provincial Policy Statement

The Provincial Policy Statement, 2020 is issued under Section 3 of the *Planning Act* (RSO 1990, c. P.13) and comes into effect on May 1, 2020. As with the previous Provincial Policy Statement, 2014, the new policy provides direction on matters of provincial interest related to land use planning and development. According to MMAH (2020), the goals of the proposed changes to the policy were to:

- Encourage an increase in the mix and supply of housing;
- Protect the environment and public safety;
- Reduce barriers and costs for development and provide greater certainty;
- Support rural, northern and Indigenous communities; and,
- Support the economy and job creation.

Natural gas pipelines are defined as “infrastructure” under the Provincial Policy Statement, 2020. Given that the Project will be replacing an important gas pipeline supplying existing customers, the Project is in line with the policy’s direction, which states that “healthy, liveable and safe communities are sustained by...ensuring that necessary *infrastructure* and public service facilities are or will be available to meet current and projected needs” (MMAH 2020).

5.3.1.2 City of Ottawa Official Plan

The City of Ottawa Official Plan is a component of Ottawa 20/20, the City's Growth Management Strategy. It provides a policy framework to guide development to the year 2036, addressing matters of provincial interest defined by the *Planning Act* (RSO 1990, c. P.13) and the Provincial Policy Statement (City of Ottawa 2003).

The Project does not conflict with the Strategic Directions of the Official Plan which include: Managing Growth; Providing Infrastructure; Maintaining Environmental Integrity; and Building Liveable Communities (City of Ottawa 2003).

5.3.2 Existing and Planned Land Use

The City of Ottawa (2003) Official Plan outlines land use designations within the City, which are implemented through a range of more detailed land-use zones in the City's Zoning By-law (No. 2008-250). The Project, as a natural gas pipeline, is considered a "public utility" within the context of the Official Plan and is generally permitted in all land use designations (City of Ottawa 2003). Public utilities, such as natural gas pipelines, are not subject to the provisions of the Zoning By-law (No. 2008-250).

For reference, the Study Area overlaps the following land use zones outlined in Schedule B (Urban Policy Plan) of the Official Plan (City of Ottawa 2003).

- **General Urban Area** – According to Section 3.6.1 of the Official Plan, this designation permits "the development of a full range and choice of housing types to meet the needs of all ages, incomes and life circumstances, in combination with conveniently located employment, retail, service, cultural, leisure, entertainment and institutional uses". A large portion of the Study Area is within this zone; it includes Project routing along St. Laurent Boulevard (up to Montreal Road), a portion of Sandridge Road, Montreal Road, Cummings Avenue, Brittany Drive, Queen Mary Street, Prince Albert Street, West Presland Road, Drouin Avenue, North River Road, and Vanier Parkway. More specifically, the Phase 3 IP Segments 1 and 2, the Phase 4 XHP Preferred Route, NPS-4-inch Segment (St. Laurent Boulevard), and Phase 4 XHP North-South Alternatives 1 to 4 largely occur within this zone.
- **Mixed Use Centre** – According to Section 3.6.2 of the Official Plan, this designation permits "a broad variety of land uses at transit-supportive densities, such as offices, secondary and post-secondary schools, hotels, hospitals, large institutional buildings, community recreation and leisure centres, daycare centres, retail uses, entertainment uses, services (such as restaurants), high- and medium-density residential uses and mixed-use development". The Study Area generally overlaps this zone along Ogilvie Road, Coventry Road, Cyrville Road, and Highway 417; it includes a small portion of Phase 3 IP Segment 2 and the majority of Phase 3 IP Segment 3, as well as the majority of the Phase 4 XHP East-West Alternatives 1, 2, and 3, the east-

west portions of the Phase 4 XHP Preferred Route, and a small portion of the Phase 4 XHP North-South Alternatives 3 and 4.

- **Urban Employment Area** – According to Section 3.6.5 of the Official Plan, this designation permits large parcels of land to be developed primarily for business and economic activity, with uses that predominantly consist of “offices, manufacturing, warehousing, distribution, research and development facilities and utilities”. The Study Area overlaps this zone south of the Alexandria Rail Corridor and includes Project routing along St. Laurent Boulevard (south of Innes Road), Belfast Road, Michael Street, Industrial Avenue, Bourassa Street, Gladwin Crescent, and Lancaster Road. More specifically, Phase 3 IP Segment 4, as well as a small portion of the Phase 4 XHP Preferred Route and Phase 4 XHP North-South Alternatives 1 and 2 occur within this zone on Michael Street and Belfast Road.
- **Major Open Space** – According to Section 3.3 of the Official Plan, this designation protects the larger open spaces in the City that are to be generally available for public use and enjoyment. The designation permits “roads and other infrastructure...where they maintain the overall quality and character of the open space, protect natural and cultural features, and enhance public access and opportunities for leisure use”. The Study Area overlaps this zone along Sir George-Étienne Cartier Parkway, Sandridge Road, Aviation Parkway, and North River Road; it includes the majority of the Phase 4 XHP Preferred Route, as well as a small portion at the north end of Phase 4 XHP North-South Alternatives 1 to 4, and Phase 3 IP Segment 1 along Sandridge Road.
- **Urban Natural Features** – According to Section 3.2.3 of the Official Plan, this designation is intended to preserve natural features that are currently managed for conservation or passive leisure uses and includes natural landscapes such as woodlands, wetlands, watercourses, and ravines. The Study Area briefly overlaps this zone along Hillsdale Road around Sandridge Road and Sir George-Étienne Cartier Parkway and at a location west of Aviation Parkway near Hemlock Road and Brittany Drive; it includes a small portion of the Phase 4 XHP Preferred Route, as well as the north ends of Phase 4 XHP North-South Alternatives 1 to 4 and Phase 3 IP Segment 1.
- **Arterial Main Street** – According to Section 3.6.3 of the Official Plan, streets with this designation are automobile-oriented, with four or more lanes and generally do not provide on-street parking. The predominant land use is single-purpose commercial.

These streets are expected, over time, to gradually change through redevelopment such that “residential and employment uses will be introduced at higher densities...and new development and public infrastructure will be designed to improve walking and cycling, as well as access to transit”. This designation occurs along Montreal Road (east of St. Laurent Boulevard), St. Laurent Boulevard, and Ogilvie Road within the Study Area; the Project footprint overlaps this designation where proposed routing occurs along Montreal Road, at the intersection of Ogilvie Road and Aviation Parkway, and along St. Laurent Boulevard, south of Innes Road.

- **Traditional Main Street** – According to Section 3.6.3 of the Official Plan, streets with this designation are planned as “compact, mixed-use, pedestrian-oriented streets that provide for access by foot, cycle, transit and automobile”. This designation occurs west of St. Laurent Boulevard along Montreal Road and McArthur Avenue within the Study Area; the Project footprint does not directly overlap this designation.

5.3.3 Population, Employment, and Economic Activities

5.3.3.1 Population and Demographics

The City of Ottawa is the fourth largest city in Canada and second largest in Ontario, by population (City of Ottawa 2020a). According to the 2016 Census, the City of Ottawa experienced a 5.8% increase in population between 2011 (883,391 people) and 2016 (934,243 people) (Statistics Canada 2017). Comparatively, the Province of Ontario experienced a population increase of approximately 4.6% over the same period (Statistics Canada 2017). In 2016, the City of Ottawa had an average population density of approximately 335 people per square kilometre and the average age of the population was 40 years (Statistics Canada 2017).

More recent data from the City of Ottawa 2018 Annual Report shows that the City’s population at the end of 2018 was estimated at 991,429 people and is anticipated to increase to 1.15 million people by 2031, which represents a 16.6% increase between 2018 and 2031. Immigration is a major contributor to Ottawa’s continued population growth (City of Ottawa 2018).

5.3.3.2 Employment and Economy

Ottawa's economy centres on two major sectors – high-tech and the federal government, which, together, account for 37% of Ottawa's total gross domestic product (City of Ottawa 2020a). On a national scale, the City has relatively low economic diversity, ranking sixth among Canada's six largest cities (i.e., Vancouver, Montreal, Toronto, Edmonton, and Calgary), which reflects a concentration of jobs in the public service sector, driven by the role of the federal government in the City's economy (Ottawa Community Foundation 2020). The lower than average economic diversity encountered in Ottawa is counterbalanced by the relative stability provided by the fact that federal government employment and spending provide a buffer against economic downturns (Ottawa Community Foundation 2020).

According to the 2016 Census, the City of Ottawa has a labour participation rate of 67.5% and an unemployment rate of 7.2%. Similarly, the Province of Ontario has a labour participation rate of 64.7% and an unemployment rate of 7.4% (Statistics Canada 2017). However, more recent data from the City of Ottawa 2018 Annual Development Report suggests that the City's unemployment rate is actually much lower, reported at 4.6% as of the end of 2018 (City of Ottawa 2019).

5.3.3.3 Commercial and Industrial Activity

The Study Area supports a variety of commercial and industrial activities, mainly along St. Laurent Boulevard and Coventry Road. The Vanier Business Improvement Area (BIA) is located in the Study Area to the west of St. Laurent Boulevard along Montreal Road and McArthur Avenue; however, it is not directly within the Project footprint.

A number of commercial activities occur along St. Laurent Boulevard including various retail shops, grocery stores, and food services. The St. Laurent Shopping Centre, a major shopping mall, is located at the corner of Coventry Road and St. Laurent Boulevard, just north of Highway 417. In addition, the Ottawa Train Yards retail district is located just outside the Study Area between Belfast Road and Industrial Avenue, west of St. Laurent Boulevard.

South of Highway 417, the Study Area predominantly supports industrial activities, interspersed with some commercial uses. There is a large industrial park located around the Alexandria Rail Corridor, which is encountered by the Project routing along Michael

Street, Industrial Avenue, St. Laurent Boulevard (south of Innes Road), Bourassa Street, Gladwin Crescent, and Lancaster Road.

5.3.4 Human Occupancy and Resource Use

5.3.4.1 Culture, Tourism, and Recreation

There are various cultural and recreational services and tourist attractions in the Study Area such as scenic parkways, trails, cultural points of interest, parks, and museums.

Sir George-Étienne Cartier Parkway and the Aviation Parkway are considered scenic highways. The NCC provides parking lots along Sir George-Étienne Cartier Parkway where travellers can pull over and view the Ottawa River or access multi-use trails, such as the Ottawa River Pathway and Aviation Pathway, which are a part of the larger Capital Pathway network (NCC 2020). These points of interest are located within the Study Area primarily around the Phase 4 XHP Preferred Route. The Aviation Pathway trail runs parallel to the Aviation Parkway on the west side, and the Phase 4 XHP Preferred Route would be installed on the east side of the parkway, away from the multi-use trail.

There are a variety of public parks in the Study Area including, but not limited to, Copp Park at McKay Lake near Hillsdale Road and Sandridge Road; London Terrace Park and Hemlock Park, near the intersection of Hemlock Road and St. Laurent Boulevard; Helen Redpath Thomson Park and Cummings Park along Cummings Avenue; Ken Steele Park along Ogilvie Road between Aviation Parkway and Cummings Avenue; Ogilvie North Park near the intersection of Ogilvie Road and Cyrville Road; Overbrook Park along Queen Mary Street; Riverside Memorial Park at the intersection of Queen Mary Street and North River Road; and Alda Burt Park along the west side of St. Laurent Boulevard just north of the intersection with Smyth Road. In addition, there is the Raymond Chabot Grant Thornton Park/Baseball Stadium (home of the Ottawa Champions Baseball Club) located between Coventry Road and Highway 417, east of the Vanier Parkway.

There are two major museums in the Study Area – the Canadian Aviation and Space Museum, located along the Phase 4 XHP Preferred Route at the intersection of Sir George-Étienne Cartier Parkway and Aviation Parkway, and the Canadian Science and Technology Museum, located on Lancaster Road along the Phase 3 IP Segment 4 route. Another point of interest is the Royal Canadian Mounted Police (RCMP) stables and

Musical Ride Centre which are located on Sandridge Road, along the Phase 3 IP Segment 1 route and all Phase 4 XHP North-South Alternative routes. In addition, the Beechwood Cemetery, home of the National Military Cemetery of the Canadian Forces, is located on the west side of St. Laurent Boulevard, along the Phase 3 IP Segment 1 route and all Phase 4 XHP North-South Alternative routes. Located in the southeast corner of the cemetery property is Macoun Marsh, which is a local research and conservation area.

5.3.4.2 Neighbourhoods and Residences

There are a number of residential neighbourhoods within the Study Area including Rockcliffe Park, Manor Park, Wateridge Village, Vanier North, Vanier South, Overbrook-McArthur, Carson Grove-Carson Meadows, Elmvale-Canterbury, and Hawthorne Meadows-Sheffield Glen. There is also the Beechwood Cemetery and the Notre-Dame Cemetery within the Study Area, located on the west side of St. Laurent Boulevard, between Hemlock Road and Montreal Road.

The Project footprint is adjacent to residences mainly along Sandridge Road, Brittany Drive, Cummings Avenue, Queen Mary Street, Prince Albert Street, West Presland Road, and Drouin Avenue, and is associated with the routing of the Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard), and the Phase 4 XHP Alternatives, as well as Phase 3 IP Segment 1, which occurs along Sandridge Road. The Phase 4 XHP Preferred Route and the remaining Phase 3 IP Segments largely avoid residential areas. Most residential buildings located in the Study Area are low density and predominantly single family homes. There are some high density apartment buildings located within the Study Area, although these are infrequent.

5.3.5 Infrastructure and Services

5.3.5.1 Existing Linear Infrastructure

The Project footprint encounters various existing linear infrastructure including transportation infrastructure (i.e., City roads, federal roads, a provincial highway, railway line, bike lanes and cycle paths), telecommunication utilities (e.g., cables), water and wastewater infrastructure (i.e., sewer and water lines), and an electricity transmission corridor.

Schedule E of the City of Ottawa (2003) Official Plan classifies the roads in the Study Area as part of the Urban Road Network. The roads in the Project footprint are classified as follows:

- **Federally-owned Roads** – includes Sir George-Étienne Cartier Parkway and Aviation Parkway; located within the Project footprint of the Phase 4 XHP Preferred Route
- **Provincial Highways** – includes Highway 417 and interchanges; located within the Project footprint of the Phase 4 XHP Preferred Route and all Phase 4 XHP North-South and East-West Alternatives
- **Arterial Roads** – includes St. Laurent Boulevard, Montreal Road, Ogilvie Road, Coventry Road, Cummings Avenue (south of Ogilvie Road), and Industrial Avenue; located within the Project footprint of all Phase 3 IP Segments, the Phase 4 XHP Preferred Route, the Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard), the Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road), and all Phase 4 XHP North-South and East-West Alternatives
- **Collector Roads** – includes a portion of Sandridge Road, a portion of St. Laurent Boulevard (from Sandridge Road to Hemlock Road), Cummings Avenue, Cyrville Road, Russell Road, and Lancaster Road; located within the Project footprint of all Phase 3 IP Segments, Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard), and all Phase 4 XHP North-South and East-West Alternatives
- **Major Collector Roads** – includes a small portion of Cummings Avenue from Donald Street to Ogilvie Road, and Labelle Street; located within the Project footprint of the Phase 4 XHP Preferred Route and all Phase 4 XHP North-South and East-West Alternatives
- **Local Roads** – includes all other roads in the Study Area and are encountered by all Phase 3 and Phase 4 routes

Many of the roads within the Project footprint provide paved shoulders or bike lanes for cycling. There is a dedicated cycle track on Coventry Road and on St. Laurent Boulevard between Innes Road and Bourassa Street. There is also the Aviation Pathway multi-use trail that parallels Sir George-Étienne Cartier Parkway and Aviation Parkway within the Study Area of the Phase 4 XHP Preferred Route.

Most of the roads in the Project footprint support public transit and the transitway overlaps with the Highway 417 interchanges. The St. Laurent Transit Station is located at the St. Laurent Shopping Centre, in proximity to the Study Area.

The Project footprints of the Phase 4 XHP Preferred Route and Phase 4 XHP North-South Alternatives 1 and 2 cross the Alexandria Rail Corridor once, at Michael Street, and the Phase 4 XHP North-South Alternatives 3 and 4 cross the Alexandria Rail Corridor once, just north of the St. Laurent Control Station.

The Project footprints of the Phase 4 Preferred Route, all Phase 4 XHP North-South Alternative Routes and Phase 3 IP Segments 2, 3, and 4 cross Hydro Ottawa corridors in the following approximate locations:

- In the vicinity of Ogilvie Road, Cyrville Road, and St. Laurent Boulevard
- In the vicinity of Coventry Road and Belfast Road
- In the vicinity of Industrial Avenue and St. Laurent Boulevard

5.3.5.2

Community Services and Institutions

The City of Ottawa is responsible for providing municipal services such as social housing, emergency and protective services, waste management, roads, sewers, water, parks and recreation, libraries and archives, museums, transit, long-term care homes, and child care and children's services.

There are a number of community services within, or in close proximity to, the Study Area including libraries, arenas, community centres, long-term care homes and seniors' residences, fire stations, police stations, and paramedic stations; however, none of these services are located within the Project footprint. These community services are located mainly in the Vanier North, Vanier South, and Overbrook-McArthur neighbourhoods to the west of St. Laurent Boulevard and north of Highway 417, as well as in the Elmvale-Canterbury neighbourhood to the south of Highway 417.

Notable health care institutions within the Study Area include the Montfort Hospital, which is located adjacent to the Phase 4 XHP Preferred Route along the Aviation Parkway at the intersection of Montreal Road, and the Perley and Rideau Veterans' Health Centre, which is located on Russell Road, just south of the Phase 3 IP Segment 4 route.

The RCMP Headquarters are within the Study Area, located along the Vanier Parkway, north of Highway 417 and adjacent to the westbound on-ramp. The Phase 4 XHP Preferred Route and all of the Phase 4 XHP East-West Alternatives parallel the Vanier Parkway at this location.

There are some elementary and secondary schools within, or in close proximity to, the Study Area; however, none are located within the Project footprint of the Phase 3 and Phase 4 XHP Preferred Routes. The Queen Mary Street Public School is adjacent to the Phase 4 XHP East-West Alternative 1 route along Queen Mary Street and all Phase 4 XHP North-South Alternative routes are adjacent to the Our Lady of Mount Carmel School on Cummings Avenue. La Cité Collégiale, a post-secondary institution, is located to the east of the Aviation Parkway and Phase 4 XHP Preferred Route. The Canadian Police College is located on Sandridge Road, adjacent to the Phase 3 IP Segment 1 route, the Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard), and the Phase 4 XHP North-South Alternatives.

5.3.6 Interests of Indigenous Communities

A review of applicable mapping and correspondence with the MENDM indicated that the Project may have the potential to affect Indigenous communities who hold or claim Aboriginal or Treaty Rights protected under Section 35 of Canada's *Constitution Act, 1982*. These communities include:

- Algonquins of Ontario; and,
- Mohawk Council of Akwesasne.

To date, consultation with Indigenous communities has not resulted in the identification of potential impacts of the Project on Aboriginal or Treaty Rights. No issues or concerns have been raised by the communities, at this stage. Additional information pertaining to consultation with Indigenous communities is provided in **Section 3.5**.

5.3.7 Archaeological and Cultural Heritage Resources

A Stage 1 Archaeological Assessment was undertaken by Timmins Martelle Heritage Consultants Inc. (TMHC) that consisted of a review of current land use, historic and modern maps, registered archaeological sites and previous archaeological studies, past settlement history for the area and a consideration of topographic and physiographic

features, soils, and drainage. A copy of the Stage 1 Archaeological Assessment report prepared for the Project is provided in **Appendix A**. The report was submitted to the MHSTCI on March 19, 2020.

The Stage 1 Archaeological Assessment confirmed that most of the Project footprint is considered extensively disturbed (58.3%; 235.36 ha), sloped (3.7%; 15.09 ha), wet (3.6%; 14.43 ha), or previously assessed (1.4%; 5.71 ha) and no longer contains the potential for recovering archaeological resources. However, a large area (32.5%; 131.28 ha) within the Project footprint retains archaeological potential and should be subject to Stage 2 archaeological assessment. In addition, a cemetery boundary investigation may be required for the Notre Dame Cemetery at the intersection of St. Laurent Boulevard and Montreal Road and for the Beechwood Cemetery at the intersection of Hemlock Road and St. Laurent Boulevard.

An MHSTCI Cultural Heritage Checklist (**Appendix B**) was completed to determine if protected heritage properties are present within the Study Area. The checklist review determined that the Study Area overlaps property identified, designated, or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value. The Study Area includes buildings over 40 years of age, overlaps cemeteries, is within a Canadian Heritage River watershed, and overlaps properties that are the subject of municipal, provincial, and federal commemorative and interpretive plaques. In addition, there is local or Aboriginal knowledge or accessible documentation suggesting that properties within the Study Area are considered a landmark in the local community or contain structures or sites that are important in defining the character of the area; have a special association with a community, person, or historical event; and contain, or are part of, a cultural heritage landscape.

A Cultural Heritage Assessment Report will be completed for the Project by a qualified person in order to determine if a Heritage Impact Assessment is required prior to construction.

Effects Assessment and Proposed Mitigation

This section provides the assessment of the potential effects associated with the Project on the physical, natural, and socio-economic environment (**Table 7**). The effects assessment was conducted for the Phase 3 Preferred Routes and the Phase 4 XHP Preferred Routes.

Recommended mitigation measures are also described in this section and select mitigation measures are shown on **Figure 14**.

The majority of potential Project-related effects can be avoided by locating the pipeline within existing, previously disturbed municipal road rights-of-way.

Table 7: Potential Effects, Mitigation Measures, and Potential Residual Effects of Project Construction and Operations

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
PHYSICAL ENVIRONMENT				
Physiography and Topography	<ul style="list-style-type: none"> The pipeline will mainly be installed within, or immediately adjacent to, existing road rights-of-way. The topography in these areas is generally level or gradually inclined and is heavily influenced by grading conducted for past utility and road works. Roads, sidewalks, and adjacent vegetated areas will be returned to their pre-construction grade following construction. 	<ul style="list-style-type: none"> No effects to physiography and topography are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Surficial Geology and Soils	<ul style="list-style-type: none"> The pipeline will mainly be installed within, or immediately adjacent to, road rights-of-way. The soils and subsoils in the Project footprint have been heavily disturbed by past utility and road works and related infilling. A search of publicly available data revealed no records of historical contamination in the Project footprint; however, information from the NCC indicates that there is potential for contaminated soils to be encountered in the vicinity of the Aviation Parkway at the intersection of Montreal Road near a former gas station site and near a former runway associated with CFB Rockcliffe. The potential for leaks or spills from Project activities to affect soils is considered in Accidents and Malfunctions (Section 8.0). 	<ul style="list-style-type: none"> Discovery of historical contamination during construction. 	<ul style="list-style-type: none"> The contractor should proceed with construction cautiously and be aware of the potential for contaminated soils. If contaminated soils are suspected, Section 8.13: Suspect Soil Excavation and Disposal Requirements of Enbridge's Construction and Maintenance Manual 2020 should be followed as suspect soils must be safely handled and disposed of in a manner consistent with regulatory requirements. Additional subsurface investigations (confirmatory and waste classification samples) should take place in areas suspected of having soil contamination. Enbridge's Suspect Soil Procedure provides direction for managing contaminated sites that are encountered during construction. Should suspect soils be encountered, third party consultants are on-call 24/7 to provide support. Suspect soils are typically identified based on the following: <ul style="list-style-type: none"> An odour emanating from the excavation; A significant change in colour, oil sheen, texture or stunted vegetation condition; The presence of coloured, odorous or non-water like liquid seeping into the excavation; and, The presence of solid wastes including drums, containers or tanks. If suspect soils are identified, implement the Suspect Soils Procedure (see Section 8.13 of Enbridge's 	<ul style="list-style-type: none"> No residual effect is anticipated following implementation of the recommended mitigation measures.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<p>Construction and Maintenance Manual 2020 for further details).</p> <ul style="list-style-type: none"> If indications of contamination are encountered on NCC property, notify the NCC's Environmental Services. 	
Groundwater	<ul style="list-style-type: none"> The pipeline will be installed at a typical depth (top of pipe) of approximately 1.2 m and may be installed using a combination of open-cut trenching and trenchless techniques. Should sections of the pipeline trench encounter the groundwater table, groundwater may exfiltrate into the trench and may require dewatering to facilitate construction. Similarly, groundwater may be encountered at trench depth where integrity digs are conducted during operations. There is the potential to encounter contaminated groundwater in conjunction with the discovery of historically contaminated soils. Water used for hydrostatic testing has the potential to contaminate groundwater. Bentonite slurry will be generated during construction if trenchless construction methods are used. There is potential for bentonite slurry to seep into porous subsurface formations, reduce groundwater quality, and leave the tunnel along a preferential flow pathway and inadvertently seep into a nearby watercourse, or interfere with nearby structures (i.e., roadways). Bentonite slurry, when not managed appropriately, is considered an industrial waste and so requires specific handling. The potential for leaks or spills from Project activities to affect groundwater is considered in Accidents and Malfunctions (Section 8.0). 	<ul style="list-style-type: none"> Reduction in groundwater quality. 	<p>General</p> <ul style="list-style-type: none"> Review and adhere to Enbridge's Waste Management Plan to avoid contaminant introduction during construction. Maintain equipment in good working condition such that equipment and vehicles are free of leaks. Store all fuels, chemicals, and other lubricants away from drainage features and on relatively flat areas in contained storage areas. Re-fuelling activities should be undertaken a minimum of 30 m away from drainage features and other sensitive environmental features. Should a spill occur, the MECP Spills Action Centre (1-800-268-6060) should be contacted immediately and containment should occur as soon as practical; Enbridge's Environment Department should also be notified (1-855-336-2056). If a spill occurs on NCC property, notify the NCC's Environmental Services. <p>Dewatering</p> <ul style="list-style-type: none"> Register under the EASR where dewatering in excess of 50,000 L/day and up to 400,000 L/day is required. Excess water should be directed away from sensitive natural features. Obtain a PTTW from the MECP where dewatering in excess of 400,000 L/day is required. Excess water should be directed away from sensitive natural features. Develop a Groundwater Management Plan prior to construction. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short to medium-term in duration, and not significant.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<ul style="list-style-type: none"> Potentially contaminated groundwater should be managed and disposed of in accordance with applicable regulatory requirements. Additional measures are provided in Section 32.10: Spills Response and Reporting and Section 8.6.3.1: Dewatering of Enbridge’s Construction and Maintenance Manual 2020. 	
Groundwater (cont’d)	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> See above 	<p>Hydrostatic Testing</p> <ul style="list-style-type: none"> The disposal of water used for hydrostatic testing should be completed through a permitted disposal to the sanitary sewer or trucked off-site for disposal. Water may be accessed from a municipal water source for testing, where possible. A PTTW will be required from the MECP if volumes extracted from a natural water body to facilitate hydrostatic testing exceed 50,000 L/day. This may also be subject to discussions with RVCA and MNRF/MECP. Hydrostatic tests should be planned in advance to allow for water source and discharge management and regulatory notification, if required. Hydrostatic tests should be conducted in accordance with Section 23: Testing of Pipelines of Enbridge’s Construction and Maintenance Manual 2020. <p>Bentonite Slurry</p> <ul style="list-style-type: none"> Bentonite slurry generation can be reduced by using a centrifuge to screen out solids and fines, allowing the bentonite to be reused on-site to a certain extent. Prior to disposal, bentonite slurry can be treated by solidification methods and removed from the site under the appropriate waste classification. The composition of the bentonite slurry should be determined based on the geotechnical conditions of the site. The application of bentonite slurry should be monitored frequently by the Contractor. 	<ul style="list-style-type: none"> See above

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<ul style="list-style-type: none"> • Extra caution should be exercised near drainage features, natural features, and nearby structures that could be impacted. • Additional measures are provided in Section 12: Trenchless Installations of Enbridge's Construction and Maintenance Manual 2020. 	
Bedrock	<ul style="list-style-type: none"> • The overburden thickness (i.e., depth to bedrock) in the Study Area varies between approximately 0 m to 15 m. There are areas of exposed bedrock in the Study Area. • The majority of the pipeline will likely be buried between 0.9 m to 1.2 m deep; however, the pipeline will be installed mainly in previously disturbed and infilled road rights-of-way, and it is unlikely that bedrock will be encountered during pipeline construction. 	<ul style="list-style-type: none"> • No effects to bedrock are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
NATURAL ENVIRONMENT				
Atmospheric Environment	<ul style="list-style-type: none"> • Air emissions (including greenhouse gases) from vehicle and equipment use (i.e., exhaust and dust) will occur during construction and site-specific maintenance activities (e.g., preventative maintenance) during operations. • Air contaminants from vehicle and equipment use include sulphur dioxide, nitrogen oxide, volatile organic compounds, carbon monoxide, and particulate matter. In addition, carbon dioxide, a greenhouse gas, is emitted from internal combustion engines. • Emissions produced through welding cannot be mitigated; however, these emissions will be short-term and localized. It is not anticipated that this will be a significant contributor to air and greenhouse gas emissions. 	<ul style="list-style-type: none"> • Temporary and localized increase in air emissions during construction and operations (where preventative maintenance is performed). 	<ul style="list-style-type: none"> • Limit the area of open trenches (where possible) to reduce dust. • Implement dust control measures during dry and windy conditions. Dust control measures should be monitored regularly to increase efficiency. • Equip vehicles with emission controls, as applicable, and operate within regulatory requirements. • Limit long-term idling, where possible. • Limit construction activities during high wind events. 	<ul style="list-style-type: none"> • Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Aquatic Environment	<ul style="list-style-type: none"> • Surface water features in the Study Area consist of McKay Lake, Ottawa River, Rideau River, three small storm water management ponds, and five small, unnamed watercourses that are directly or indirectly influenced by the urban landscape and coincide with engineered drainage infrastructure. McKay Lake, the Ottawa River, and the Rideau River are not directly crossed by the Project routes. • There is potential fish presence and habitat in McKay Lake, Ottawa River, Rideau River, the five small watercourses, and the storm water management ponds in the Study Area. • Construction activities may result in temporary disruption of flow, reduction in surface water quality (e.g., localized sedimentation), alteration of fish habitat, or death/injury of fish in watercourses directly crossed by the pipeline route(s), depending on the crossing technique (i.e., open cut crossings are more likely to impact the aquatic environment than trenchless crossings). • The potential for leaks or spills from Project activities to affect the aquatic environment is considered in Accidents and Malfunctions (Section 8.0). 	<ul style="list-style-type: none"> • Temporary reduction in surface water quality and alteration of water flow during construction if trenched crossing techniques are implemented. 	<ul style="list-style-type: none"> • Re-contour the streambed to approximate the pre-construction profile and channel configuration to ensure that flow patterns are unaltered. Watercourses are not to be realigned or straightened in any way nor have their hydraulic characteristics changed. • Complete all instream activity within a reasonable period of time, having regard for the site-specific conditions, to limit the duration and severity of disturbance. • Schedule crossing construction, to the extent practical, to complete trenching, lowering-in and backfill with continuous effort or to the satisfaction of the Environmental Inspector or Enbridge designate. • Maintain the quantity and quality of stream flow, if present, throughout crossing construction. Trench through the watercourse after isolation is installed and operational, and maintain stream flow at all times. • Install and maintain erosion and sediment control measures prior to commencing grading within the vicinity of a watercourse. • Any stockpiled materials shall be stored and stabilized at a minimum distance of 30 m from the watercourse. • Avoid or reduce grading within the 10 m riparian buffer of watercourses, unless otherwise approved by the Environmental Inspector. Grading within 10 m of watercourses, if approved, may be appropriate if completion of this activity results in reduced erosion and sedimentation risk. • Delay grading on the approach slopes to watercourses until immediately prior to the commencement of construction of the crossing, if practical. If grading occurs, ensure that interim erosion control is installed, as appropriate. 	<ul style="list-style-type: none"> • Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Aquatic Environment (cont'd)	<ul style="list-style-type: none"> • See above 	<ul style="list-style-type: none"> • See above 	<ul style="list-style-type: none"> • Refueling and maintenance of equipment must be set back from any water body a minimum of 100 m to minimize the potential for water pollution, unless otherwise approved by Enbridge's Environment Department. • Machinery should arrive on site in a clean condition and be maintained free of fluid leaks. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water. • Banks and riparian areas are to be restored to their original condition if any disturbance occurs. • Undertake site restoration works immediately following construction and in accordance with Section 15.8: Site Restoration of Enbridge's Construction and Maintenance Manual 2020. • Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs. 	<ul style="list-style-type: none"> • See above

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
		<ul style="list-style-type: none"> Alteration of fish habitat or death/injury of fish during construction if trenched crossings techniques are implemented. 	<ul style="list-style-type: none"> Develop site-specific water crossing plans in consultation with Enbridge prior to conducting any in-water work. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows. Consult with RVCA and other relevant agencies (e.g., MECP, DFO, ECCC) to determine appropriate timing windows. Stabilize the streambed and restore the original channel shape, bottom gradient and substrate to pre-construction condition. Ensure banks are stabilized, restored to original shape, adequately protected from erosion and revegetated, preferably with native species. Temporary isolation should be pursued to allow work "in-the-dry" while maintaining the natural downstream flow by installing dams upstream and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. Use dams made of non earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water. A qualified Fish Biologist or technician must complete a fish salvage from the isolated area prior to and during dewatering where isolated crossing techniques are used. Fish salvage activities will need to be conducted in accordance with applicable permit approvals and minimize harm and stress to fish. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.
Aquatic Environment (cont'd)	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Release captured fish to pre-determined areas of similar or better habitat, where possible, preferably downstream of the work site. Pump sediment laden (trench) water into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering any water body. 	<ul style="list-style-type: none"> See above

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<ul style="list-style-type: none"> • Remove accumulated sediment and excess spoil from the isolated area before removing dams. • If rock is used to stabilize banks, it should be clean, free of fine materials, and of sufficient size to resist displacement during peak flood events. The rock should be placed at the original stream bank grade to ensure there is no infilling or narrowing of the watercourse. • Gradually remove the downstream dam first to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle. • During the final removal of dams, restore the original channel shape, bottom gradient and substrate at these locations as required and manually if possible. • Pumped diversions should be used to divert water around the isolated area to maintain natural downstream flows and prevent upstream ponding. • Ensure intakes of pumping hoses are equipped with appropriate screening to avoid entrainment and impingement of fish. • Ensure the pumping system is sized to accommodate any expected high flows of the watercourse during the construction period. Pumps should be monitored at all times, and back-up pumps should be readily available on-site in case of pump failure. • Protect pump discharge area(s) to prevent erosion and the release of suspended sediments downstream, and remove this material when the works have been completed. 	
Wetlands	<ul style="list-style-type: none"> • There are several unevaluated wetlands in the Study Area. Wetlands in the Project footprint are mainly associated with the Phase 4 XHP Preferred Route along Aviation Parkway and along Ogilvie Road, between Aviation Parkway and Cummings Avenue, adjacent to Ken Steele Park. 	<ul style="list-style-type: none"> • Temporary alteration of wetland habitat, hydrological, and/or biogeochemical function. 	<ul style="list-style-type: none"> • Use existing roads as access routes, where possible, to avoid disturbance to riparian vegetation. • Operate machinery on land above the ordinary high water mark and in a manner that minimizes disturbance to wetlands. • Machinery should arrive on site in a clean condition and be maintained free of fluid leaks. Wash, refuel and service machinery and store fuel and other materials 	<ul style="list-style-type: none"> • Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short to medium-term in

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
	<ul style="list-style-type: none"> Construction will be primarily confined to existing disturbed rights-of-way and interactions with wetland communities are anticipated to be minimal. The potential for leaks or spills from Project activities to affect wetlands is considered in Accidents and Malfunctions (Section 8.0). 		<ul style="list-style-type: none"> for the machinery away from wetlands to prevent any deleterious substance from entering wetlands. Undertake site restoration works immediately following construction and in accordance with Section 15.8: Site Restoration of Enbridge's Construction and Maintenance Manual 2020. Narrow the construction area in the vicinity of wetlands and limit vegetation removal to the extent practical. Clearly identify the limits of the work area prior to beginning construction. Visually inspect machinery and/or engine compartments each day during construction for basking reptiles such as snakes. A nest search (migratory birds) should be undertaken by a qualified biologist prior to construction if construction occurs between March 15 and August 31 (ECCC 2018, MNR 2000). Sweep wetland areas prior to and during construction for the presence of wildlife. Contact the Environmental Inspector or on-call biologist for any nest or wildlife observations. Do not seed marsh wetlands. Allow for natural revegetation, unless otherwise requested by a landowner. Do not dewater any wetland. Although temporary dewatering may be necessary during trenched wetland crossings, trench water should not be permanently removed from a wetland. 	duration, and not significant.
Areas of Natural and Scientific Interest and Other Environmentally Significant Areas	<ul style="list-style-type: none"> The St. Laurent/Montreal Road Earth Science ANSI occurs on the outer edge of the Study Area of the Phase 4 Preferred Route, NPS 6-inch Segment (Montreal Road), and Phase 4 XHP North-South Alternatives 1 and 3. The site is currently developed with high density residential buildings and commercial businesses and is outside of the Project footprint. 	<ul style="list-style-type: none"> No effects to Areas of Natural and Scientific Interest and other environmentally significant areas are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Terrestrial Habitat and Vegetation	<ul style="list-style-type: none"> The majority of the Study Area associated with the Phase 3 routes is classified as residential, commercial, industrial, institutional, and transportation and utilities land uses. Natural environment communities mainly occur in the Study Area associated with the Phase 4 XHP Preferred Route, on NCC lands along Sir George-Étienne Cartier Parkway and Aviation Parkway. Greenland communities are largely associated with manicured urban parks and open spaces in the Study Area. The Project will be installed within, or immediately adjacent to, existing road rights-of-way. Vegetation encountered will likely consist of common roadside vegetation of minor ecological value (vegetation capable of colonizing new roadside edges). However, if construction activities (e.g., temporary laydown areas, equipment encroachment) extend into vegetated areas, activities could result in the temporary loss or alteration of vegetation. Construction activities could result in the introduction or spread of invasive species and/or weeds. The potential for leaks or spills from Project activities to affect vegetation is considered in Accidents and Malfunctions (Section 8.0). 	<ul style="list-style-type: none"> Temporary loss or alteration of vegetation during construction. 	<ul style="list-style-type: none"> Minimize the width of the construction area to reduce the amount of vegetation affected. Limits of the workspace should be clearly marked to avoid encroachment into adjacent vegetated areas and to avoid unnecessary tree removals. Where feasible, construction traffic should be limited to the existing road allowance to avoid potential compression to tree root zones. Protect vegetation adjacent to the working area from construction traffic and/or materials storage. If required, obtain permits for tree removal. Depending on the location of potential tree removal(s), consult with applicable federal, provincial, and municipal agencies (i.e., NCC, ECCC, MECP, City of Ottawa) to ascertain appropriate measures for tree removals or injuries that should be undertaken and any requirements for compensation. An Arborist Assessment should be conducted to ascertain potential tree removal in the temporary working space and permanent easement and used to support permitting. Upon completion of construction, all vegetation removed or damaged should be replaced with appropriate native species. Ontario native seed mixes should be appropriate for the habitat type and existing land use. Undertake construction in a manner consistent with Section 8.2: Clearing of Enbridge’s Construction and Maintenance Manual 2020. Implement tree protection zones once vegetation removal is complete. The tree drip line plus an additional 1 m demarcated by fencing should be established around remaining edge vegetation to avoid soil compaction. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short to medium-term in duration, and not significant.
		<ul style="list-style-type: none"> Introduction or spread of invasive species and/or weeds during construction. 	<ul style="list-style-type: none"> All equipment will arrive to the site clean and free of soil and/or vegetation to prevent the introduction and spread of invasive species and weeds. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures,

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<ul style="list-style-type: none"> Ontario native seed mixes that are free of weed species should be used for revegetation. During the first year of post-construction monitoring, the construction right-of-way will be monitored, where required, to identify areas where vegetation re-establishment has not progressed as expected. Vegetation parameters to be assessed include weed species, density, and distribution. Should monitoring indicate that further management measures are warranted (undesirable species remain above the threshold level) to prevent the spread of weed species, Enbridge will take appropriate action to address the issue in a timely manner. 	<p>the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.</p>
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Moderate to minor wildlife habitat is anticipated to be present within the Study Area due to the presence of woodlands and wetlands that occur along Aviation Parkway and the woodland and meadow areas that occur north of Hillsdale Road; however, these natural areas are limited by the lack of broader ecosystem connectivity due to the adjacent landscapes being highly developed and disturbed as the Study Area occurs within the urban area of the City of Ottawa. The pipeline will mainly be installed within existing road rights-of-way in heavily developed areas and limited interaction with SWH is anticipated. Natural vegetation communities in the Study Area exist as isolated and highly impacted patches, dominated by invasive species and surrounded by urban infrastructure. Vegetation removal during construction may potentially limit or alter wildlife habitat. Construction activities have the potential to attract turtles looking for suitable nesting substrate between late May and early July. This can potentially impact turtles and turtle nests. The removal of vegetation can impact nesting birds if conducted during known breeding bird timing 	<ul style="list-style-type: none"> Temporary alteration of wildlife habitat, disruption of wildlife movement, and/or increase in wildlife mortality during construction. 	<p>General Measures</p> <ul style="list-style-type: none"> Flag or fence off environmentally sensitive areas prior to construction. Undertake environmental awareness training for all workers onsite to highlight issues specific to the Project. Training should focus on protocols for injured wildlife and the identification of SAR that may be encountered. All wildlife encountered should be handled by a qualified professional using approved MNRF/MECP handling protocols and relocated away from the construction area to prevent incidental harm. Nuisance and large wildlife encounters or incidents involving wildlife should be reported to the MNRF/MECP. Food waste and debris should be removed from the site daily and disposed of at an approved waste facility. Conduct pre-construction planning that includes a review of the areas of potential habitat. Minimize the width of the construction area to reduce the amount of vegetation affected. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
	<p>windows (generally between March 15 and August 31 [ECCC 2018, MNR 2000]).</p> <ul style="list-style-type: none"> • Snakes may use open areas such as road shoulders to bask potentially putting them at risk from construction activities. • Construction activities have the potential to cause physical harm to slower moving animals like frogs, snakes, and turtles particularly adjacent to wetlands. • Noise from construction activities can cause some temporary disturbance to local wildlife. • Trenching activities have the potential to cause physical harm to wildlife that may fall in any open trenches, particularly if the trenches are left exposed overnight. • The potential for leaks or spills from Project activities to affect wildlife and wildlife habitat is considered in Accidents and Malfunctions (Section 8.0). 		<ul style="list-style-type: none"> • Suspend construction if active habitat is discovered and an adequate setback distance cannot be maintained. • Maintain habitat connections, where possible, during construction. • Implement measures to restore lost habitat/habitat connections. <p>Reptiles and Amphibians</p> <ul style="list-style-type: none"> • Abide by regulatory timing windows and setback distances. General timing windows for reptiles and amphibians are: <ul style="list-style-type: none"> – Turtle/snake active season (when exclusion fencing is required in designated turtle/snake habitat areas) – April 1 to September 30 – Turtle nesting period – May 15 to June 30 – Turtle hatchling period – August 15 to October 31 – If a turtle is encountered on site, stop work and allow the individual to leave the area – Amphibian breeding period – April 15 to June 30 • Flag or fence off environmentally sensitive areas (wetlands/watercourses) prior to the timing windows for nesting, breeding, and overwintering listed above, if possible. The recommended depth of the fence and height of the fence differs depending on reptile/amphibian group: <ul style="list-style-type: none"> – Turtles: bury fencing a minimum of 10-20 cm and vertical height of at least 60 cm. – Snakes: bury fencing a minimum of 10-20 cm and vertical height of at least 60 cm. Note, stakes should be installed on the activity side to prevent snakes using stakes to climb fencing. 	
Wildlife and Wildlife Habitat (cont'd)	• See above	• See above	• Avoid using gravels and fine-grained materials for access roads, if possible, as turtles prefer these conditions for nesting.	• See above

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
			<ul style="list-style-type: none"> • Complete a wildlife sweep within the exclusion area following fence installation to ensure there is no trapped wildlife. • Visually inspect machinery and/or engine compartments each day during construction for basking reptiles such as snakes. <p>Birds</p> <ul style="list-style-type: none"> • Abide by regulatory timing windows (generally March 15 to August 31 [ECCC 2018, MNR 2000]) and setback distances when vegetation removal is required or when working in or directly adjacent to natural features. • Conduct pre-construction nest sweeps if construction will occur in migratory bird restricted activity period (March 15 to August 31 for waterfowl; April 15 to August 31 for other). Nest sweeps are valid for 7 days. • Protect active nests by flagging or fencing off an appropriate setback distance as determined by a qualified professional. • If a nest is found during construction activities, stop work and notify the Environmental Inspector or Enbridge designate. <p>Bats</p> <ul style="list-style-type: none"> • Narrow construction footprint, where possible, to limit tree removals. • Complete assessments prior to clearing to determine if candidate maternity trees (those with loose bark, crevices, hollows or cavities) are present. • Clearing of potential bat roosting trees is to be avoided between May 1 and August 31. If potential bat roosting trees require removal during this window, 	

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Species at Risk	<ul style="list-style-type: none"> Based on desktop reviews and preliminary field studies, the potential for SAR and Species of Conservation Concern to occur in the Study Area is low given the highly developed and disturbed characteristics of the area. The potential for SAR and Species of Conservation Concern in the Project footprint will be further investigated during summer 2020 field surveys and Project-specific regulatory requirements in relation to SAR will be determined through ongoing consultation with federal and provincial agencies (e.g., MECP and ECCC). 	<ul style="list-style-type: none"> Temporary alteration of SAR habitat, disruption of SAR movement, and/or increase in SAR mortality during construction. 	<p>additional surveys may be required. Contact a qualified individual prior to clearing.</p> <ul style="list-style-type: none"> Implement recommended mitigation measures for the protection of vegetation, wetlands, aquatic environment, and wildlife and wildlife habitat discussed in this table. Abide by the conditions of regulatory permits or approvals when working in areas where there is potential to interact with SAR or Species of Conservation Concern. Provide SAR identification sheets to workers that outline habitat, identifying characteristics and mitigation measures. Document SAR encounters and notify appropriate regulatory authorities. 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.
SOCIO-ECONOMIC ENVIRONMENT				
Planning Policies	<ul style="list-style-type: none"> The Project is required to replace an important natural gas pipeline supplying customers in the National Capital Region. Under the relevant plans and policies reviewed for this report, the Project would generally be defined as necessary infrastructure and is, therefore, in line with the policy directions for maintaining safe, livable, and economically diverse and prosperous communities. 	<ul style="list-style-type: none"> No effects to planning policies are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Existing and Planned Land Use	<ul style="list-style-type: none"> It is not anticipated that Project activities will have any impact on existing or planned land use as the proposed pipeline will be installed within, or immediately adjacent to, existing, previously disturbed road rights-of-way. The Project does not require re-zoning of lands and will not restrict future development within existing linear infrastructure corridors (beyond their currently existing and planned allowable uses). The Project is a permissible use of the existing road rights-of-way and Enbridge will obtain all required permits and approvals prior to construction and operations. 	<ul style="list-style-type: none"> No effects to existing and planned land use are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Population, Employment, and Economic Activities	<ul style="list-style-type: none"> The Project is located in an urban area where there are numerous commercial and industrial businesses. Construction activities may affect traffic and/or access to businesses for a short period of time. The Project is not anticipated to have a noticeable impact on business levels due to the short-term duration of construction activities and the implementation of appropriate traffic control and access measures. The Project will employ a small workforce for a short period of time and no permanent jobs will be created or lost as a result of the Project. 	<ul style="list-style-type: none"> No effects to population, employment, and economic activities are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Human Occupancy and Resource Use	<ul style="list-style-type: none"> The Project is located in an urban area adjacent to residential neighbourhoods and construction activities will temporarily cause nuisance noise for local residents and businesses. Visual effects of construction cannot be mitigated, however, will be short-term and localized. The presence of construction equipment and vehicles is not uncommon or unexpected in an urban environment. During operations, visual effects will be limited to the presence of above-ground safety signage. 	<ul style="list-style-type: none"> Temporary increase in nuisance noise during construction. 	<ul style="list-style-type: none"> Construction activities will be carried out in compliance with municipal noise by-laws with respect to noise and construction equipment usage. No construction activities will occur on Statutory Holidays, Sundays and at night as stipulated in respective noise by-laws without applicable noise by-law exemptions. General noise control measures will be implemented during construction (i.e., proper maintenance of equipment, muffling systems, minimum idling of equipment and vehicles). 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.
Infrastructure and Services	<ul style="list-style-type: none"> The Project is located in an urban area where traffic levels can be high, especially at peak commuting times. Construction may cause traffic disruptions (e.g., lane closures or detours) impacting traffic flow, on-street parking, bus routes, cycling tracks, and access to driveways or side streets. The Project footprint crosses a number of municipal arterial roads (e.g., St. Laurent Boulevard, Montreal Road, Ogilvie Road, Coventry Road, and Industrial Avenue), and is in proximity to provincial Highway 417 and its interchanges. The Montfort Hospital, an important health care centre for the City, is located along the Phase 4 XHP Preferred Route. 	<ul style="list-style-type: none"> Temporary traffic disruptions during construction. 	<ul style="list-style-type: none"> Traffic access will be maintained, where possible, during construction. However, lane closures and traffic detours may be required to allow construction equipment and materials passage, or where open-cut construction is planned. Good management and best practices will be implemented during construction to minimize traffic disruption. If required, temporary detour routes will be provided to reduce potential impacts to commuters. Appropriate signage and flag personnel will be used should detours be necessary. Enbridge is encouraged to consult with municipal staff to develop an appropriate traffic management plan to assist with maintaining traffic flow. Consultation with local transit providers and Emergency Medical Services 	<ul style="list-style-type: none"> Following the implementation of mitigation measures, the residual effect is anticipated to be low magnitude, short-term in duration, and not significant.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
	<ul style="list-style-type: none"> The Project will result in the creation of hazardous wastes (e.g., pneumatic oils from hydraulic systems, gasoline, and other lubricants and oils) and non-hazardous wastes (e.g., packaging, spent lubricating cartridges, coffee cups) requiring proper storage and disposal. 	<ul style="list-style-type: none"> Temporary increase in wastes during construction. 	<p>may also be required if temporary detours and/or bus stop relocations are deemed necessary.</p> <ul style="list-style-type: none"> A common parking area should be established for construction crews to reduce traffic and better manage parking congestion. The Contractor should be encouraged to transport construction staff to the site from a central collection point via bus or other method to reduce the potential for parking issues and traffic congestion. Enbridge will respond to any construction complaints promptly. Vehicle traffic will be managed in accordance with Section 3.9: Traffic Control and Protection Plan, Section 18: Road and Railway Crossings, Section 31.4: Pipeline Depth of Cover Survey, Section 8.5: Trenching/Excavating, Section 8.6: Trenching, and Section 8.7: Paving Excavation and Repairs of Enbridge’s Construction and Maintenance Manual 2020. An appropriate Traffic Control Plan will be developed and implemented in accordance with Ontario Traffic Manual (OTM) Book 7 – Temporary Conditions. Solid waste will be collected and disposed of appropriately in accordance with applicable regulations at a licensed waste facility. Hazardous wastes will be transported by MECP licensed waste haulers to a MECP registered disposal site. Temporary storage of wastes onsite will include the use of secured containers in designated sites away from sensitive areas. All construction waste will be disposed of in accordance with Section 4.1: Hazardous Waste Management and Disposal of Enbridge’s Construction and Maintenance Manual 2020. 	<ul style="list-style-type: none"> No residual effect is anticipated following implementation of the recommended mitigation measures.

Component	Context/Interaction	Potential Effect(s)	Mitigation Measures	Potential Residual Effect(s)
Interests of Indigenous Communities	<ul style="list-style-type: none"> To date, Indigenous communities consulted on the Project have not identified any specific issues or concerns regarding the impact of the Project on Aboriginal or Treaty Rights. Enbridge will continue to engage with Indigenous communities throughout the phases of the Project and will work with Indigenous communities to address issues or concerns, should they arise. 	<ul style="list-style-type: none"> No effects to the interests or rights of Indigenous communities are expected to occur as a result of Project activities. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Archaeological and Cultural Heritage Resources	<ul style="list-style-type: none"> The results of the Stage 1 Archaeological Assessment for the Project indicate that there is the potential to encounter previously undiscovered archaeological resources during construction. 	<ul style="list-style-type: none"> Disturbance of previously undiscovered archaeological resources during construction. 	<ul style="list-style-type: none"> Should previously undocumented (i.e., unknown or deeply buried) archaeological resources be discovered, the person discovering the archaeological resources will notify the Environmental Inspector and Enbridge Environmental Advisor. A stop-work procedure will be implemented to immediately cease alteration of the site and a licensed consultant archaeologist will be engaged to carry out archaeological fieldwork in compliance with Section 48(1) of the <i>Ontario Heritage Act</i>. Work undertaken in and around areas with known archaeological potential will be completed in accordance with Section 8.15: Archaeological Areas of Enbridge's Construction and Maintenance Manual 2020. Follow recommendations from the Stage 1 and Stage 2 archaeological assessments. If human remains are discovered during construction, a stop work procedure will be implemented and the appropriate agencies (e.g., police, coroner) will be contacted as well as Indigenous communities, if applicable. 	<ul style="list-style-type: none"> No residual effect is anticipated following implementation of the recommended mitigation measures.
	<ul style="list-style-type: none"> The results of the MHSTCI Cultural Heritage Checklist indicate that there is the potential for the Project to encounter cultural heritage resources. A Cultural Heritage Assessment Report must be undertaken by a qualified person in order to determine if a Heritage Impact Assessment is required prior to construction. 	<ul style="list-style-type: none"> Disturbance of cultural heritage resources during construction. 	<ul style="list-style-type: none"> Implement recommendations in the Cultural Heritage Assessment Report and/or Heritage Impact Assessment to be completed prior to construction. 	<ul style="list-style-type: none"> No residual effect is anticipated following implementation of the recommended mitigation measures.



<p>⊗ Road or Rail Crossing. For major road crossings (parkways, highways, and arterial roads), trenchless construction is the preferred crossing technique. For minor road crossings, open-cut construction techniques may be used. For crossing federally-owned roads (i.e., Sir George-Étienne Cartier Parkway and Aviation Parkway), contact the National Capital Commission for permit and access requirements. For crossing Highway 417 or its interchanges, contact the Ministry of Transportation for permit and access requirements. For all other crossings, contact the City of Ottawa. Enbridge will develop a Traffic Management Plan to ensure that traffic is maintained while crossings are conducted. Flag persons will be provided as required. Refer to Section 3.9 and 18 of the Enbridge Construction and Maintenance Manual 2020.</p>	<p>⊗ Construction Adjacent to School. Work will be conducted where possible during summer months when children are not in school. Construction areas will be fenced off with the appropriate signage to prevent access to the area. An Enbridge crossing guard will be provided to lead children around the work area.</p>	<p>⊗ Crossing of Electric Transmission Corridor Contact Hydro Ottawa for specifications when working in the vicinity of high-voltage transmission lines and ground equipment. No refuelling of equipment will be conducted in this area due to the possibility of stray voltage. Use voltage protection measures for vehicles and equipment working in this area.</p>	<p>⊗ Crossing of Trail or Recreational Feature Alternative routes will be established and appropriate detour signage will be installed at all locations where construction impedes the use of recreational trails.</p>	<p>⊗ Potential Crossing of Watercourse or Wetland Crossing technique (open cut or trenchless) to be determined during construction detailed design process having regard for the engineering technical feasibility of construction and natural features. All watercourses to be crossed shall be prepared and constructed according to permit conditions established by the Rideau Valley Conservation Authority. Refer to Section 12.1.2 and Section 15.0 of the Enbridge Construction and Maintenance Manual, 2020. No vehicle or equipment refuelling within 30 metres of a watercourse or wetland, unless otherwise approved by Enbridge Environment. Clean up of all watercourse and wetland crossings shall be completed to the satisfaction of the conservation authority and Environmental Inspector.</p>
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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

MITIGATION MAP
FIGURE 14
MAP 1 OF 6



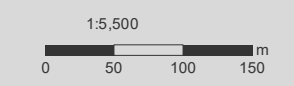
- Control Station
- Study Area (125 m)
- Project Footprint (30 m)
- Preferred Routes
- Phase 3 IP Segment I
- Phase 4 XHP Preferred Route
- School
- Path
- Arterial / Collector Road
- Local / Service / Rapid Transit Road
- Watercourse
- Waterbody
- Unevaluated Wetland



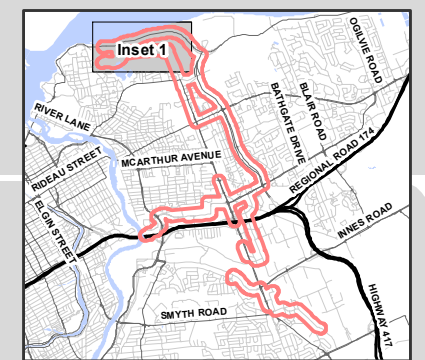
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRFC; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

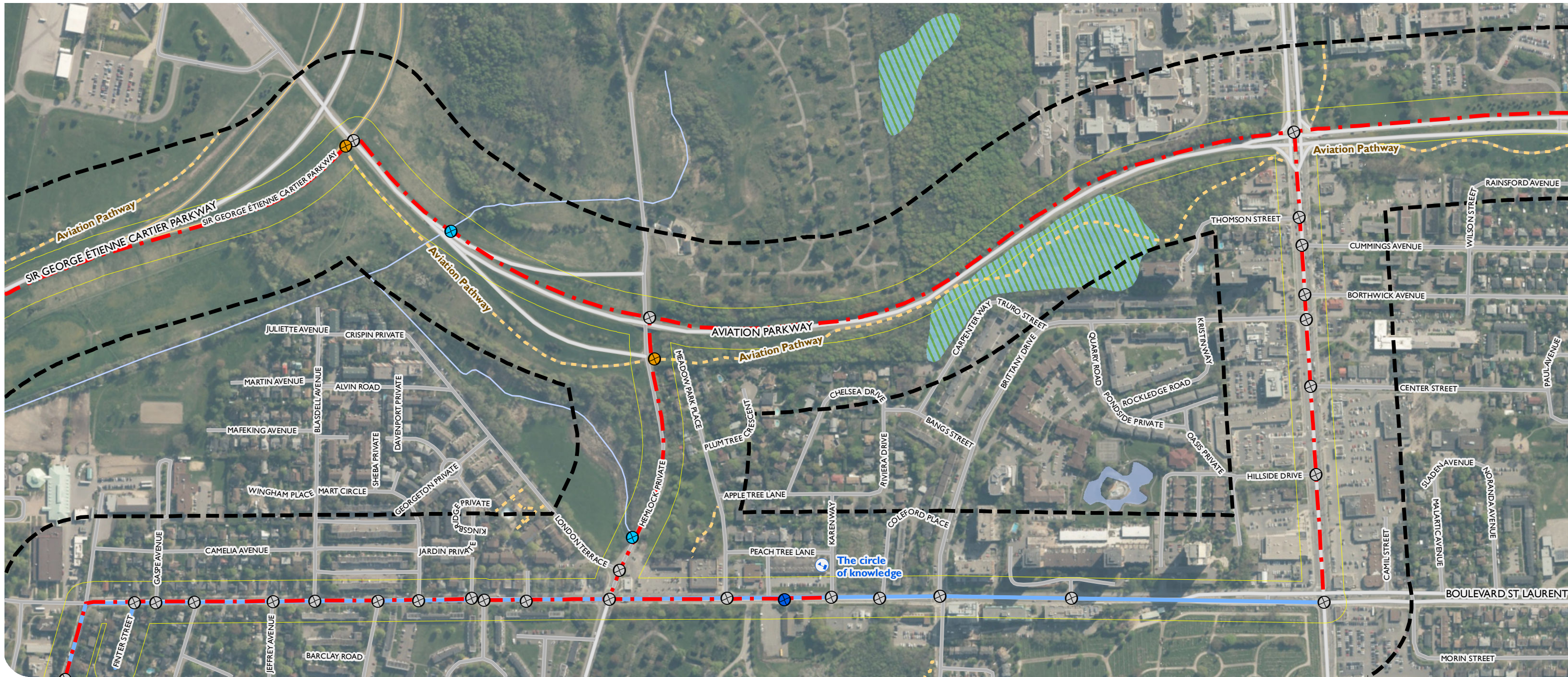
MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

- Mitigation Feature Present in Current Mapping Extent**
- ⊗ Road or Rail Crossing
 - ⊗ Potential Crossing of Watercourse or Wetland



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





<p>⊗ Road or Rail Crossing. For major road crossings (parkways, highways, and arterial roads), trenchless construction is the preferred crossing technique. For minor road crossings, open-cut construction techniques may be used. For crossing federally-owned roads (i.e., Sir George-Étienne Cartier Parkway and Aviation Parkway), contact the National Capital Commission for permit and access requirements. For crossing Highway 417 or its interchanges, contact the Ministry of Transportation for permit and access requirements. For all other crossings, contact the City of Ottawa. Enbridge will develop a Traffic Management Plan to ensure that traffic is maintained while crossings are conducted. Flag persons will be provided as required. Refer to Section 3.9 and 18 of the Enbridge Construction and Maintenance Manual 2020.</p>	<p>⊗ Construction Adjacent to School. Work will be conducted where possible during summer months when children are not in school. Construction areas will be fenced off with the appropriate signage to prevent access to the area. An Enbridge crossing guard will be provided to lead children around the work area.</p>	<p>⊗ Crossing of Electric Transmission Corridor Feature Alternative routes will be established and appropriate detour signage will be installed at all locations where construction impedes the use of recreational trails.</p>	<p>⊗ Potential Crossing of Watercourse or Wetland Crossing technique (open cut or trenchless) to be determined during construction detailed design process having regard for the engineering technical feasibility of construction and natural features. All watercourses to be crossed shall be prepared and constructed according to permit conditions established by the Rideau Valley Conservation Authority. Refer to Section 12.1.2 and Section 15.0 of the Enbridge Construction and Maintenance Manual, 2020. No vehicle or equipment refuelling within 30 metres of a watercourse or wetland, unless otherwise approved by Enbridge Environment. Clean up of all watercourse and wetland crossings shall be completed to the satisfaction of the conservation authority and Environmental Inspector.</p>
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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

MITIGATION MAP
FIGURE 14
MAP 2 OF 6



Preferred Routes

- Phase 3 IP Segment I
- Phase 4 XHP Preferred Route
- Study Area (125 m)

- Project Footprint (30 m)
- ⊗ School
- Path
- Ramp

- Arterial / Collector Road
- Local / Service / Rapid Transit Road
- Watercourse
- Waterbody

- Unevaluated Wetland

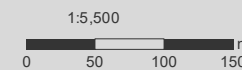
Mitigation Feature Present in Current Mapping Extent

- ⊗ Construction Adjacent to School
- ⊗ Road or Rail Crossing
- ⊗ Crossing of Trail or Recreational Feature
- ⊗ Potential Crossing of Watercourse or Wetland



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRFC; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

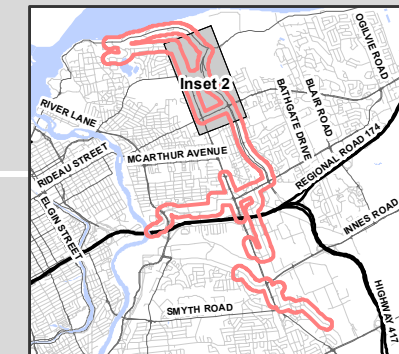
MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

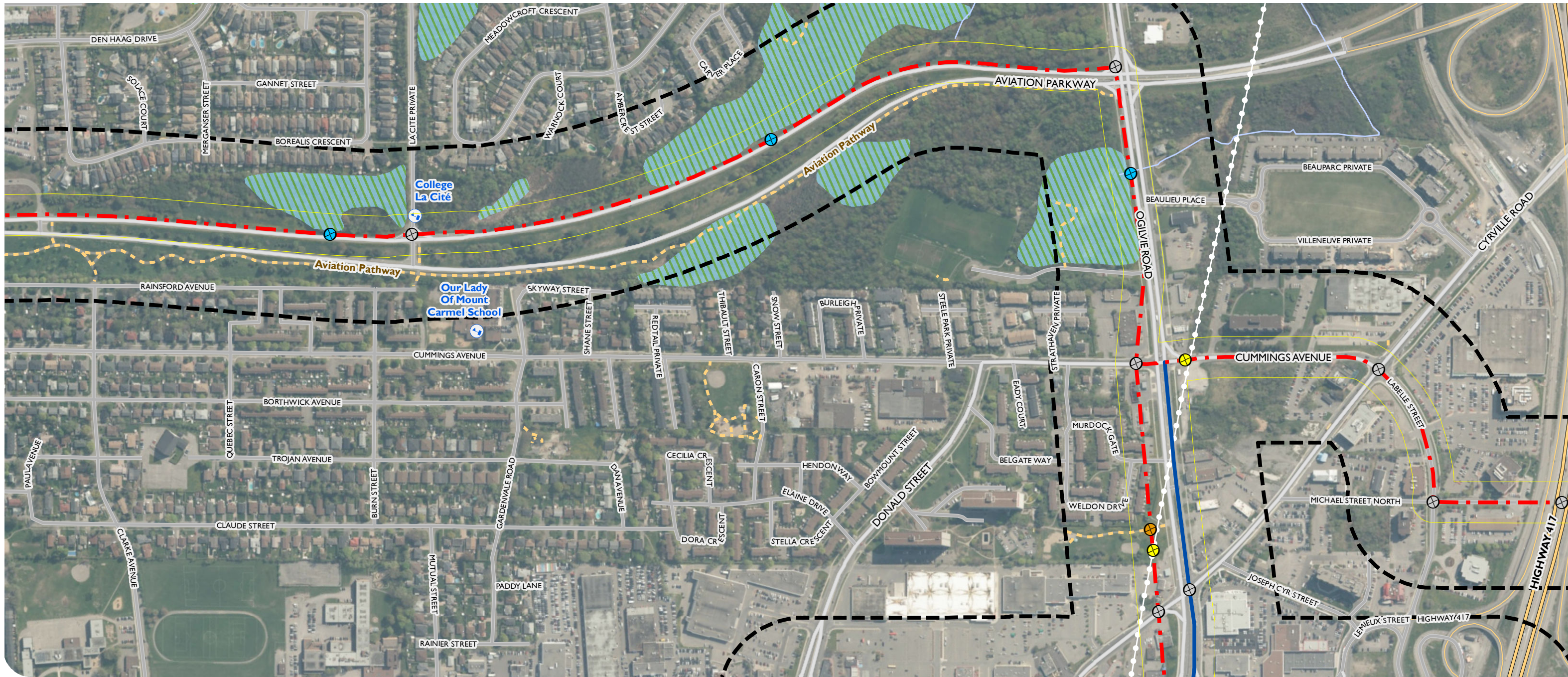


PROJECT: 19-1850

STATUS: FINAL

DATE: 2020-06-25





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⊗ Construction Adjacent to School. Work will be conducted where possible during summer months when children are not in school. Construction areas will be fenced off with the appropriate signage to prevent access to the area. An Enbridge crossing guard will be provided to lead children around the work area.

⊗ Crossing of Electric Transmission Corridor Feature Alternative routes will be established and appropriate detour signage will be installed at all locations where construction impedes the use of recreational trails.

⊗ Crossing of Trail or Recreational Feature Alternative routes will be established and appropriate detour signage will be installed at all locations where construction impedes the use of recreational trails.

⊗ Potential Crossing of Watercourse or Wetland Crossing technique (open cut or trenchless) to be determined during construction detailed design process having regard for the engineering technical feasibility of construction and natural features. All watercourses to be crossed shall be prepared and constructed according to permit conditions established by the Rideau Valley Conservation Authority. Refer to Section 12.1.2 and Section 15.0 of the Enbridge Construction and Maintenance Manual, 2020. No vehicle or equipment refuelling within 30 metres of a watercourse or wetland, unless otherwise approved by Enbridge Environment. Clean up of all watercourse and wetland crossings shall be completed to the satisfaction of the conservation authority and Environmental Inspector.

ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

MITIGATION MAP
FIGURE 14
MAP 3 OF 6



- | | | | |
|-----------------------------|--------------------------|--------------------------------------|---------------------|
| Preferred Routes | Project Footprint (30 m) | Freeway | Watercourse |
| Phase 3 IP Segment 3 | School | Ramp | Unevaluated Wetland |
| Phase 4 XHP Preferred Route | Path | Arterial / Collector Road | |
| Study Area (125 m) | Hydro Line | Local / Service / Rapid Transit Road | |

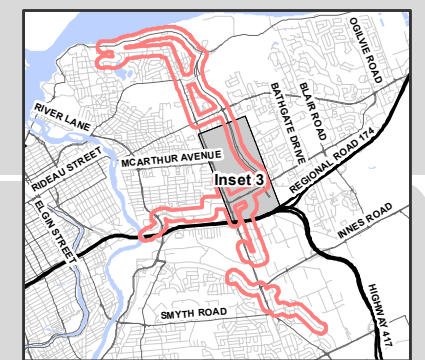


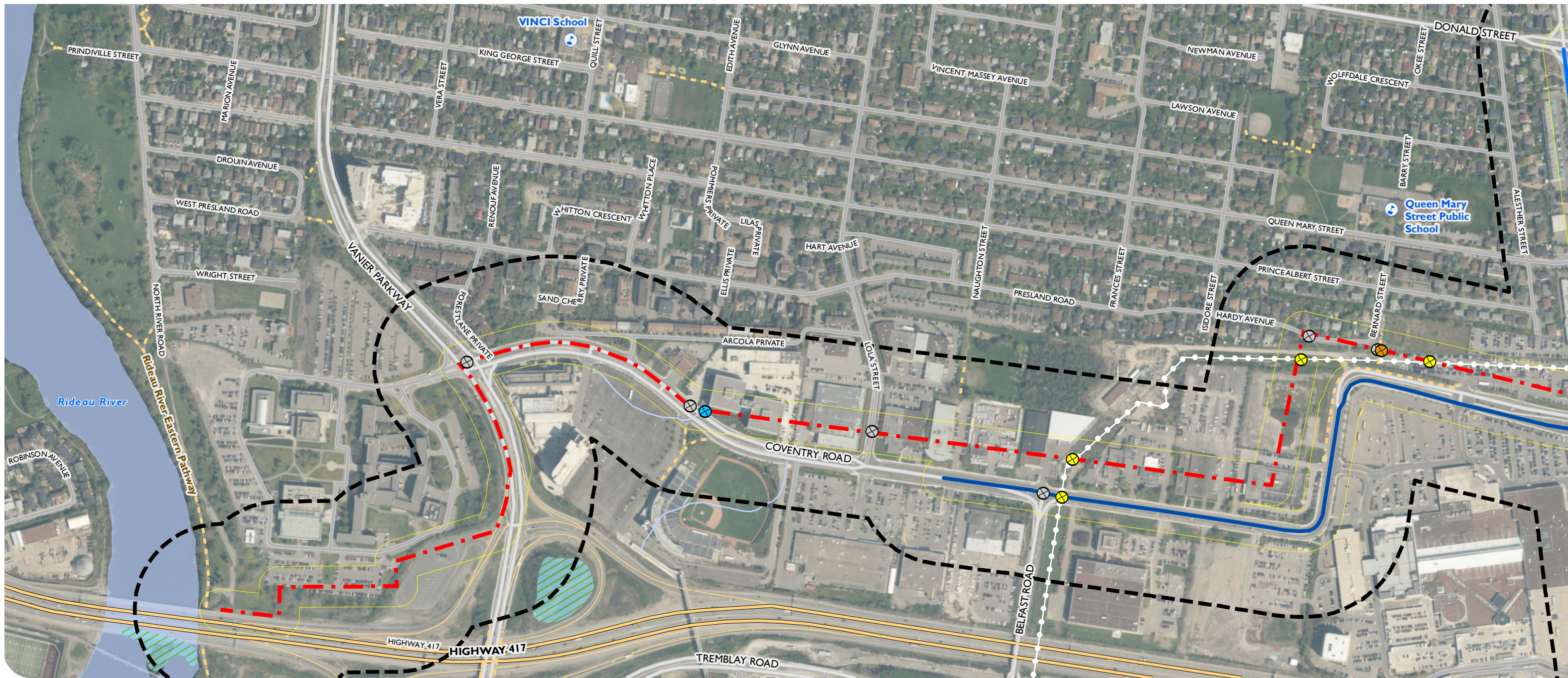
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.
MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

- Mitigation Feature Present in Current Mapping Extent**
- Crossing of Electric Transmission Corridor
 - Road or Rail Crossing
 - Crossing of Trail or Recreational Feature
 - Potential Crossing of Watercourse or Wetland



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





<p>⊗ Road or Rail Crossing. For major road crossings (parkways, highways, and arterial roads), trenchless construction is the preferred crossing technique. For minor road crossings, open-cut construction techniques may be used. For crossing federally-owned roads (i.e., Sir George-Étienne Cartier Parkway and Aviation Parkway), contact the National Capital Commission for permit and access requirements. For crossing Highway 417 or its interchanges, contact the Ministry of Transportation for permit and access requirements. For all other crossings, contact the City of Ottawa. Enbridge will develop a Traffic Management Plan to ensure that traffic is maintained while crossings are conducted. Flag persons will be provided as required. Refer to Section 3.9 and 18 of the Enbridge Construction and Maintenance Manual 2020.</p>	<p>⊗ Construction Adjacent to School. Work will be conducted where possible during summer months when children are not in school. Construction areas will be fenced off with the appropriate signage to prevent access to the area. An Enbridge crossing guard will be provided to lead children around the work area.</p>	<p>⊗ Crossing of Electric Transmission Corridor Feature Alternative routes will be established and appropriate detour signage will be installed at all locations where construction impedes the use of recreational trails.</p>	<p>⊗ Potential Crossing of Watercourse or Wetland Crossing technique (open cut or trenchless) to be determined during construction detailed design process having regard for the engineering technical feasibility of construction and natural features. All watercourses to be crossed shall be prepared and constructed according to permit conditions established by the Rideau Valley Conservation Authority. Refer to Section 12.1.2 and Section 15.0 of the Enbridge Construction and Maintenance Manual, 2020. No vehicle or equipment refuelling within 30 metres of a watercourse or wetland, unless otherwise approved by Enbridge Environment. Clean up of all watercourse and wetland crossings shall be completed to the satisfaction of the conservation authority and Environmental Inspector.</p>
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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

MITIGATION MAP
FIGURE 14
MAP 4 OF 6



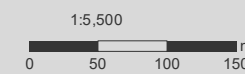
- | | | | |
|-----------------------------|--------------------------|---------------------------|--------------------------------------|
| Preferred Routes | Study Area (125 m) | Hydro Line | Local / Service / Rapid Transit Road |
| Phase 3 IP Segment 2 | Project Footprint (30 m) | Freeway | Watercourse |
| Phase 3 IP Segment 3 | School | Ramp | Waterbody |
| Phase 4 XHP Preferred Route | Path | Arterial / Collector Road | Unevaluated Wetland |



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

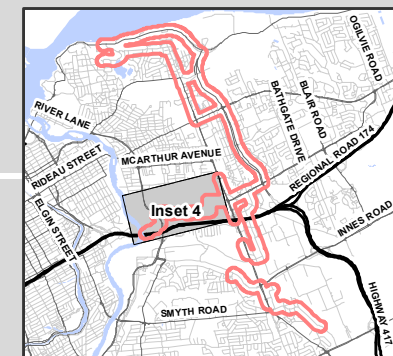
- Mitigation Feature Present in Current Mapping Extent**
- Crossing of Electric Transmission Corridor
 - Road or Rail Crossing
 - Crossing of Trail or Recreational Feature
 - Potential Crossing of Watercourse or Wetland



PROJECT: 19-1850

STATUS: FINAL

DATE: 2020-06-25





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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

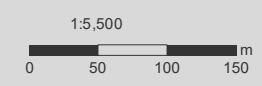
MITIGATION MAP
FIGURE 14
MAP 5 OF 6



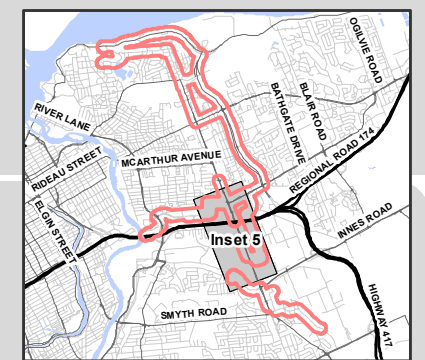
Control Station	Phase 3 IP Segment 4	School	Freeway	Watercourse
Preferred Routes	Phase 4 XHP Preferred Route	Path	Ramp	Unevaluated Wetland
Phase 3 IP Segment 2	Study Area (125 m)	Hydro Line	Arterial / Collector Road	Mitigation Feature Present in Current Mapping Extent
Phase 3 IP Segment 3	Project Footprint (30 m)	Railway	Local / Service / Rapid Transit Road	Crossing of Electric Transmission Corridor
				Road or Rail Crossing
				Crossing of Trail or Recreational Feature
				Potential Crossing of Watercourse or Wetland

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRFC; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25





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ENBRIDGE GAS INC.
ST. LAURENT OTTAWA NORTH
REPLACEMENT PIPELINE PROJECT

MITIGATION MAP
FIGURE 14
MAP 6 OF 6



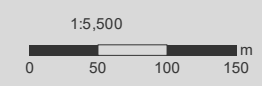
- | | | |
|-----------------------------|--------------------------|--------------------------------------|
| Preferred Routes | Project Footprint (30 m) | Arterial / Collector Road |
| Phase 3 IP Segment 4 | Path | Local / Service / Rapid Transit Road |
| Phase 4 XHP Preferred Route | Hydro Line | Watercourse |
| Study Area (125 m) | Railway | |



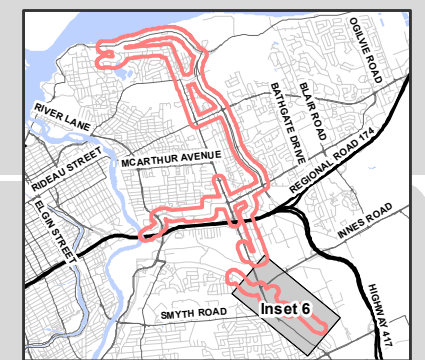
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRFC; CITY OF OTTAWA OPEN DATA
ENBRIDGE GAS INC.

MAP CREATED BY: LK/SFG
MAP CHECKED BY: ARL
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

- Mitigation Feature Present in Current Mapping Extent**
- Crossing of Electric Transmission Corridor
 - Road or Rail Crossing
 - Crossing of Trail or Recreational Feature



PROJECT: 19-1850 STATUS: FINAL DATE: 2020-06-25



7.0 Cumulative Effects Assessment

The cumulative effects assessment evaluates the significance of residual effects of the Project (i.e., effects remaining after the application of mitigation) in combination with the effects of other existing or proposed projects or developments. The cumulative effects assessment recognizes that while individual actions may not have a significant effect on the physical, natural, or socio-economic environment, multiple actions of a similar nature that occur over an extended period of time may have a significant effect.

7.1 Methods

The cumulative effects assessment was conducted in accordance with the OEB Guidelines and included developing a cumulative effects Study Area with appropriate boundaries.

For the purposes of this assessment, cumulative effects are defined as follows:

- The combination and interaction of effects of the same project;
- The combination and interaction of the effects of the proposed Project with other projects; and,
- The combined effects over time in the same space.

7.1.1 Spatial and Temporal Boundaries

Based on Dillon’s professional experience, it was determined that the spatial boundaries for the cumulative effects assessment be established as a 1 km radius from the Preferred Routes (i.e., 500 m buffer on each side of the routes).

Temporal boundaries identified for the assessment include recently constructed projects, projects currently under review, under construction, or planned within three years before or three years following Project construction (i.e., reasonably foreseeable).

7.1.2 Criteria for Significance

The same criteria that were used to assess the significance of residual effects were used for the cumulative effects assessment. For the purposes of this assessment, a “significant cumulative effect” is defined as a permanent or long-term cumulative effect

of high magnitude that has a high probability of occurrence and cannot be technically or economically mitigated.

7.1.3 Identified Projects

A desktop review of various sources was conducted to identify projects within the spatial and temporal boundaries of the cumulative effects assessment. Sources reviewed included the Canadian Impact Assessment Registry (Impact Assessment Agency of Canada 2020), Major Projects Management Office Project Inventory (Government of Canada 2019), Investing in Canada Plan Project Map (Infrastructure Canada 2020), Infrastructure Ontario Projects Map (Infrastructure Ontario 2020), Environmental Registry of Ontario (Government of Ontario 2020), RVCA Special Projects (RVCA 2020a), City of Ottawa (2020b,c), and Hydro Ottawa (2020) Planned Work and Projects.

Specific projects identified within the spatial and temporal boundaries for the cumulative effects assessment are summarized in **Table 8**; however, the list is not exhaustive. It is anticipated that future and ongoing consultation with the City and other key stakeholders (e.g., NCC) may result in the identification of other planned development activities in the cumulative effects assessment boundaries. Enbridge will work to identify efficiencies in regard to timing and coordination of Project construction with other planned developments, where feasible, in order to reduce the cumulative impact.

Table 8: Projects Identified for the Cumulative Effects Assessment

Source	Project Name	Description
Environmental Registry of Ontario (Government of Ontario 2020)	Montfort Hospital – PTTW	Proposed (December 2019) – Proposal to renew an existing PTTW for remediation purposes.
	Cummings Caron Property Limited – PTTW	Proposed (February 2020) – Proposal for a new PTTW.

Source	Project Name	Description
	2058280 Ontario Limited – Environmental Compliance Approval (Sewage)	Proposed (March 2020) – Proposal for a new Environmental Compliance Approval for the construction of storm sewers in support of a proposed new Phase 1 and an existing commercial development on lands located at 1910 St. Laurent Boulevard connecting to the City storm sewer system.
	Giant Tiger Stores Limited – Environmental Compliance Approval (Sewage)	Proposed (March 2020) – Proposal for a new Environmental Compliance Approval for industrial storm water management works serving Giant Tiger Stores Limited, located at 2480 Walkley Road.
City of Ottawa (2020b) Major Projects	O-Train Confederation Line	Completed (July 2019) – Light-rail transit system project; substantial construction completed July 27, 2019.
City of Ottawa (2020c) Construction and Infrastructure Projects	Various linear and localized construction projects	Underway and Planned (2020-2023) – The City has various ongoing and planned infrastructure construction projects in the Study Area including road resurfacing and renewals, new sidewalks and sidewalk renewals, pathway/trail renewals, bridge and culvert renewals, and water, sewer, and storm water management projects and renewals.

7.2 Analysis of Cumulative Effects

The residual effects identified for the physical and natural environment components are all anticipated to be low magnitude and short-term in duration, with the exception of residual effects on vegetation and wetlands, where the effects may be medium-term in duration since more than one growing season may be required for recovery. Based on the planned and existing developments identified, there may be cumulative effects related to:

- Reduction in groundwater quality (associated with potential multiple linear construction projects occurring simultaneously in the same right-of-way);

- Temporary alteration of vegetation;
- Temporary alteration of water quality and fish and fish habitat;
- Temporary alteration of wetland function; and,
- Temporary alteration of wildlife habitat, disruption of wildlife movement, and increase in wildlife mortality.

Through proper coordination with other developers, and the implementation of appropriate mitigation measures and industry best practices, the cumulative effects are anticipated to be low in magnitude, short to medium-term in duration, reversible, and not significant.

Based on the planned and existing developments, there is a possibility of socio-economic cumulative effects related to temporary traffic disruptions and noise. The use of appropriate mitigation techniques, coordination with the City and other developers, and the segmented approach to Project construction (i.e., construction of sections no more than 500 m in length at any given time) over a short construction timeframe for each Project Phase will reduce the magnitude of the cumulative effect. Construction activities and traffic disruptions are to be expected in a city the size of Ottawa and, while these types of activities pose a nuisance, they can be appropriately managed. Therefore, it is anticipated that the cumulative effects of temporary traffic disruptions and noise will be low to moderate in magnitude, short-term in duration, reversible, and not significant.

8.0 Accidents and Malfunctions

This section provides an overview of potential adverse effects that may result from accidents and malfunctions associated with the Project.

8.1 Accidents and Malfunctions Considered

Accidents and malfunctions are unplanned events that have the potential to result in adverse effects on the environment, should they occur. While the rigorous standards and practices that are in place make accidents or malfunctions unlikely for the Project, the potential consequences are evaluated so that emergency response and contingency planning can be identified to reduce the risk and the severity of the consequences.

Accidents and malfunctions have the potential to occur during all phases of the Project and may include the following:

- Equipment or machinery leaks or other spills; and,
- Pipeline failure during operations resulting in the release of natural gas.

Accidents and malfunctions can result from several events including equipment failure, human error, natural perils, third-party damage, or vandalism. The assessment of accidents and malfunctions takes into account the type, scale, and location of the Project, the characteristics of the product to be transported, sensitivities in the Study Area, and Enbridge's internal preventative protocols for reducing the likelihood of such events.

Enbridge implements several strategies aimed at preventing potential accidents and malfunctions including:

- Maintaining the pipeline with special pipeline coatings and cathodic protection;
- Patrolling the right-of-way regularly using aircraft, vehicles, and foot patrols; and,
- Monitoring the pipeline remotely and through in-line inspections, integrity digs, and leak surveys.

8.1.1 Equipment or Machinery Leaks or Other Spills

Hazardous materials are a component of vehicles, machinery, and construction equipment and some hazardous materials will be stored onsite during the construction

period. Potential contaminants associated with the Project may include gasoline, diesel fuel, lubricants, and hydraulic fluids. If equipment is not properly maintained or if hazardous materials are not stored or handled properly, spills may occur.

8.1.2 Pipeline Failure during Operations

Natural gas is lighter (less dense) than air, is non-toxic, and has low solubility in water. Consequently, natural gas escaping from a minor leak would volatilize to the atmosphere with little potential to adversely affect the surrounding environment.

Pipelines can be damaged by natural events or vandalism, however, more often they are damaged by regular work activities conducted by third parties (e.g., road or utility work). It is a requirement that contractors obtain utility locates prior to any ground disturbance by contacting Ontario One Call in order to decrease the possibility of accidentally damaging adjacent infrastructure.

Enbridge takes steps to ensure the safe and reliable operation of their natural gas pipelines, including continuously monitoring the entire network and performing regular field surveys to detect leaks and confirm corrosion prevention methods are working as intended. If a natural gas release is detected or reported, Enbridge promptly responds by dispatching a trained response team and isolates and repairs the leak or damage. Vandalism to the Project and response measures are considered in Enbridge's internal protocols.

8.2 Effects Assessment and Significance

The assessment of potential effects and identification of key mitigation measures for accidents and malfunctions is provided in **Table 9**. Additional mitigation measures can be found in Enbridge's Construction and Maintenance Manual.

Table 9: Potential Effects, Mitigation Measures, and Potential Residual Effects of Accidents and Malfunctions

Potential Effect(s)	Project Activity	Spatial Boundary	Mitigation Measures	Potential Residual Effect(s)
Equipment or machinery leaks or other spills resulting in contamination of the surrounding environment	Construction or site-specific maintenance during operations (e.g., integrity digs)	Project footprint (i.e., 30 m on either side of the right-of-way)	<ul style="list-style-type: none"> • Equipment and machinery should be kept in good working order and maintained on a regular basis. • Follow safe work procedures when working with, or storing, chemicals. Crews should be properly trained in the handling of wastes. • Immediately contain and clean up spills in accordance with regulatory requirements and Enbridge procedures. • Contractor(s) and construction crews should have appropriate spill containment and hazardous material and response training. • Implement applicable sections of Enbridge’s internal protocols for safety, pre-emergency preparedness, and emergency response actions. • Depending on the type/extent and or nature of spill, the following should be contacted: <ul style="list-style-type: none"> – MECP Spills Action Centre at 1-800-268-6060 (out of Province 1-416-325-3000) – MECP Pollution 24-hour public hotline at: 1-866-MOE-TIPS (1-866-663-8477) – Report emergencies by calling 911 (Emergency Services) 	A release of hazardous materials would be immediately contained and recovered. A release of this nature is expected to be avoided, or effectively mitigated, therefore, no residual effects are predicted.

Potential Effect(s)	Project Activity	Spatial Boundary	Mitigation Measures	Potential Residual Effect(s)
Pipeline failure resulting in a release of natural gas	Operations	Study Area (i.e., 125 m on either side of the right-of-way)	<ul style="list-style-type: none"> Implement applicable sections of Enbridge's internal protocols for safety, pre-emergency preparedness and emergency response. 	Depending on the size of the leak and the environmental and socio-economic components that are impacted, the duration of the residual effect may be immediate to long-term and the magnitude may be low to high. The potential residual effects of a leak are reversible with the implementation of remedial measures and residual effects are not likely to be significant.

8.3 Summary of Residual Effects

The likelihood of a significant residual effect is considered low with the implementation of appropriate preventative and mitigation measures. No significant residual effects from accidents and malfunctions are predicted for the Project.

9.0 Effects of the Environment on the Project

This section identifies the potential effects of the environment on the Project.

Potential effects of the environment on the Project are considered unlikely. Enbridge is aware of the range of environmental conditions that may affect the Project and this knowledge has been incorporated into Project planning, design, and proposed mitigation measures to avoid such effects as best as possible. The pipeline will be constructed and operated in accordance with applicable industry standards (e.g., Canadian Standards Association Standard Z662) and regulatory requirements.

9.1 Environmental Conditions Considered

The following environmental conditions were identified as potentially affecting the Project in the Study Area:

- Severe weather events (i.e., heavy or persistent precipitation, extreme temperatures, high winds, or frequent/intense storms [lightning, ice]); and,
- Natural hazards (i.e., seismic activity, flooding).

9.1.1 Severe Weather Events

Severe weather events are increasingly more common as a result of global climate change. Severe weather events may include heavy or persistent precipitation, extreme temperatures, high winds, or frequent/intense storms. These events may, in turn, lead to natural hazards such as flooding or mass wasting events, depending on the location and circumstances.

9.1.2 Natural Hazards

9.1.2.1 Seismic Activity

Shifting of large sections of the earth's crust (tectonic plates) has the ability to cause severe earthquakes and accounts for over 97% of earthquakes worldwide (Natural Resources Canada [NRCan] 2019a). Central and Eastern Canada have a relatively low rate of earthquake activity due to their location in a stable continental region within the North American Plate. Rather than being caused by the shifting of earth's tectonic

plates, seismic activity in this zone appears to be related to regional stress fields with earthquake activity concentrated in areas of crustal weakness (NRCan 2019a).

The Project is located within the Western Quebec Seismic Zone (NRCan 2019a) and is in an area with a medium seismic hazard rating (NRCan 2019b). No significant earthquakes have been recorded in the Study Area over the past 30 years (NRCan 2020).

9.1.2.2

Flooding

The effects of climate change and severe weather (e.g., heavy or persistent precipitation) can lead to flood events. The Project is in an urban environment, dominated by hardened surfaces, where storm water is largely managed by the City's sewer system rather than by ground infiltration, which occurs in more naturalized areas (i.e., areas dominated by vegetation and natural soils). Urban flooding can occur where the sewer system is overwhelmed by inputs either from extreme precipitation, overland flooding from nearby watercourses, or some combination thereof, including factors such as snow/ice melt and frozen or saturated ground conditions.

The 30 m Project footprint is not located within any RVCA regulatory floodplain areas (RVCA 2020b); however, the 125 m Study Area does encompass the RVCA regulatory floodplain areas of the Ottawa River (near Rockcliffe Control Station and along Sir George-Étienne Cartier Parkway) and the Rideau River (along North Rideau Road and the Highway 417/Hurdman Bridge crossing).

9.2

Effects Assessment and Significance

The assessment of effects of the environment on the Project is provided in **Table 10**.

Table 10: Potential Effects, Mitigation Measures, and Potential Residual Effects of Effects of the Environment on the Project

Potential Effect(s)	Project Activity	Spatial Boundary	Mitigation Measures	Potential Residual Effect(s)
<p>Severe weather events (i.e., heavy or persistent precipitation, extreme temperatures, high winds, or frequent/intense storms [lightning, ice]) and natural hazards (i.e., seismic activity, flooding) may affect the Project in the following ways:</p> <ul style="list-style-type: none"> • Delay the Project schedule; • Damage construction equipment; • Increase safety concerns for workers during construction; and • Damage the operating pipeline. 	Construction and Operations	Project footprint and Study Area	<ul style="list-style-type: none"> • Notify the Environmental Inspector in the event mitigation measures identified in the Project-specific Environmental Protection Plan (EPP) are ineffective at avoiding or reducing environmental effects or if alternative measures to address environmental issues are warranted due to site or weather conditions. • Postpone work during severe weather events that may pose a hazard to safety and/or result in damage to Project infrastructure and equipment. • Design and construct the pipeline in accordance with all applicable industry standards (e.g., Canadian Standards Association Standard Z662). • Conduct regular monitoring during O&M in accordance with regulatory requirements. 	With the implementation of mitigation measures, no residual effects are predicted for potential effects of the environment on the Project.

9.3 Summary of Residual Effects

The likelihood of a significant residual effect on the Project is considered low with the implementation of appropriate preventative and mitigation measures. No significant residual effects due to severe weather events or natural hazards are predicted for the Project.

Inspection and Monitoring Recommendations

It is Dillon's recommendation that Enbridge employ the services of an Environmental Inspector to be present during the construction of the pipeline. The Environmental Inspector will provide inspection of contractor environmental mitigation measures and respond to other environmental issues that may develop during pipeline construction. The Environmental Inspector should be familiar with pipeline construction techniques, the OEB Guidelines, and the implementation of the mitigation recommendations in this ER.

The primary objective of environmental inspection is to determine the effectiveness of mitigation measures (and modify as needed), inspect the construction site and determine compliance with applicable environmental legislation, regulations, industry standards, and project permit conditions, including any notification requirements or conditions set by the OEB. Standard conditions of approval set by the OEB for Enbridge may include:

- Requirements to notify the OEB of any material changes in construction or restoration procedures;
- Notifying the OPCC Chair of commencement and completion of construction and facility testing;
- Filing post-construction interim and final monitoring reports; and,
- Applying a landowner complaint tracking system.

The primary objective of environmental monitoring during construction is to monitor the physical, natural, and socio-economic environment to determine any adverse effects and to verify that the construction site is returned to pre-construction conditions as soon as possible. The purpose of post-construction monitoring is to ascertain the success of the restoration effort and mitigation measures. The knowledge gained from inspection and monitoring can be used in future projects to avoid or minimize similar problems that may arise. Monitoring reports also allow for the collection of quantitative data for the assessment of effects, and to recommend mitigation measures for future projects.

10.1 Pre-Construction

A number of activities should be undertaken prior to construction including:

- Acquisition of all necessary permits and approvals;
- The development of a Project-specific Environmental Protection Plan (EPP), including appropriate management and contingency plans (e.g., Waste Management, Traffic Management, Spill Contingency) and Environmental Alignment Sheets with detailed mitigation measures;
- Environmental training for the Contractor. This usually occurs with the Construction Manager and Project Supervisor. The purpose of the training is to educate the construction crew on the key components of the EPP, including the location of sensitive environmental features and associated mitigation measures including SAR, wetlands, watercourses, and working within residential areas. Other areas of concern along the rights-of-way are also reviewed in the field at this time; and,
- A pictorial record of conditions is compiled to compare restoration efforts with pre-construction conditions.

10.2 Construction

10.2.1 Environmental Inspectors and Monitors

The Environmental Inspector's responsibilities will be to monitor construction with respect to the mitigation and monitoring recommendations outlined in this report, and that construction activities are carried out in compliance with permit conditions.

Environmental Monitors (typically QPs) should be used as-needed during construction (e.g., handling wildlife).

10.2.2 Spill Contingency Plan

A contingency plan for accidental spills should be developed. At a minimum, there should be spill kits on site and a telephone number posted for the MECSP Spills Action Centre (1-800-268-6060), which will be reported by Enbridge Environment in the event of a spill. The Environmental Inspector will be trained in Enbridge's spill response protocols and should impart this training at the pre-construction meeting.

10.3 Post-Construction

10.3.1 Monitoring Reports

In order to assess the effectiveness of restoration programs within the rights-of-way used for pipeline construction and, in keeping with the intent of the OEB Guidelines, environmental monitoring reports will be prepared including an Interim Monitoring Report and a Final Monitoring Report. As per OEB Guidelines, the Interim Monitoring Report is required within 3 months after final tie-ins, while the Final Monitoring Report is to be prepared no later than 15 months after the in-service date, or, where the deadline falls between December 1 and May 31, the following June 1.

10.3.1.1 Interim Monitoring Report

The following provides an outline of an Interim Monitoring Report based on the OEB Guidelines.

- Describe the predicted effects (including cumulative effects) and mitigation measures;
- Compare predicted effects with those that actually occurred, explaining the reasons for any deviations;
- Outline any changes in the proposed construction, monitoring, or restoration procedures that took place during the Project, and the reason for the changes;
- Discuss the effectiveness of the measures applied and indicate opportunities for improvement in future pipeline projects;
- Provide a log of complaints during construction and the actions taken in response; and,
- Detail any instances where provisions of a local by-law have not been complied with and the reasons for such non-compliance.

10.3.1.2 Final Monitoring Report

The following provides an outline of a Final Monitoring Report based on the OEB Guidelines.

- Describe the condition of the rehabilitated right-of-way and actions taken subsequent to the submission of the Interim Monitoring Report;

- Compare predicted and actual effects (including cumulative effects, mitigation measures, and explain any deviations which may have occurred);
- Report the results of any monitoring programs and analyses such as soil and water sampling, and make recommendations as appropriate;
- Discuss the effectiveness of the mitigation measures as well as the monitoring programs and indicate opportunities for improvement in future pipeline projects;
- Provide a breakdown of environmental costs incurred for the Project. In particular, items of cost associated with specific measures related to pre-construction, construction, or restoration should be described;
- Provide a log of complaints received during construction and the actions taken in response; and,
- Include instances where the provision of any local by-law has not been complied with and the reasons for such non-compliance.

The Final Monitoring Report should also address any potential cumulative effects which may arise for pipelines such as reduced soil productivity, land use restrictions due to increased easement widths, or additional above ground facilities and/or repeated construction through sensitive areas.

Summary and Conclusions

The Study involved undertaking an inventory of physical, natural, and socio-economic features within the Study Area. This information was used to produce maps identifying features that could be impacted by pipeline construction and operation. Enbridge selected the Preferred and Alternative routes for the Study based on environmental and socio-economic concerns, as well as technical and economic feasibility requirements. The Preferred Routes are mainly sited in existing, previously disturbed road rights-of-way, which greatly reduces potential adverse effects to the surrounding environment.

Mitigation measures were recommended to reduce potential negative effects to the environment. These recommendations, in combination with Enbridge's Construction and Maintenance Manual, are anticipated to effectively protect the physical, natural, and socio-economic features along the Preferred Routes. The mitigation recommendations contained in this report, along with Enbridge's construction policies, should be included in contract specifications. Use of a qualified Environmental Inspector and Environmental Monitors will help reduce disturbance to the environment during pipeline construction activities.

Lastly, preparation of Interim and Final Post-Construction Monitoring Reports and implementation of an Environmental Inspection Program will assist with monitoring the area to determine any changes to the environment from pre-construction conditions following the construction period.

Dillon does not anticipate any significant adverse effects from the construction and operation of the Project with the implementation of the mitigation measures recommended in this report.

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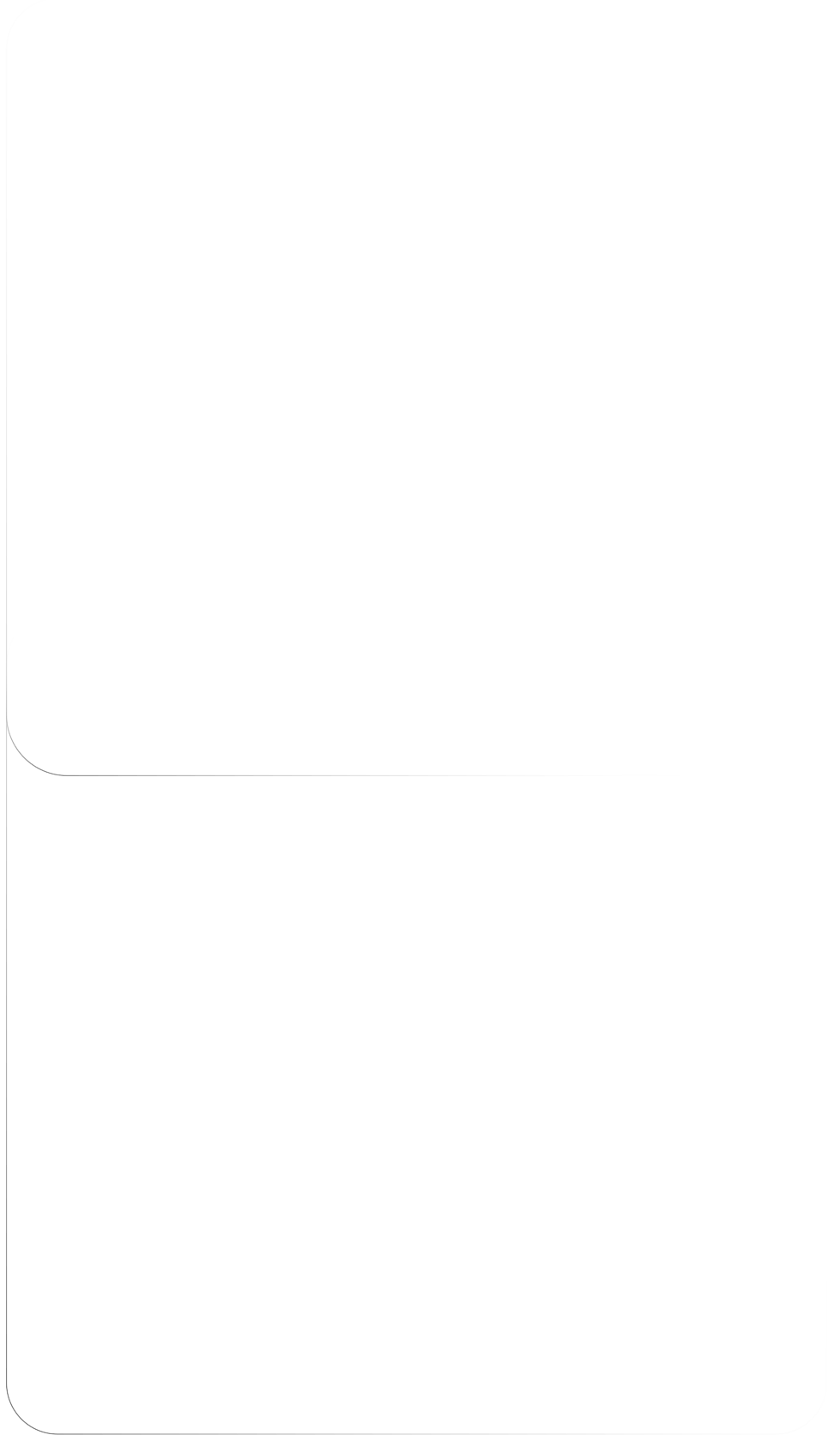
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**Stage I Archaeological Assessment
St. Laurent Pipeline Project Phase 3 and 4
Enbridge Gas Inc.**

**Part of Lots A, 1 to 5, 8 to 11 and 13 to 15, Junction Gore,
Part of Lots 23 to 26, Concession 1 on Ottawa River,
Part of Lots 26 and 27, Concession 2 on Ottawa River and
Part of Lots 26 and 27, Concession 3 on Ottawa River
Geographic Township of Gloucester
Carleton County
City of Ottawa, Ontario**

Original Report

Submitted to:

The Ministry of Heritage, Sport, Tourism and Culture Industries

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PIF No: P324-0473-2019
Project No: 2019-300
Dated: March 19, 2020



EXECUTIVE SUMMARY

In the fall of 2019, Timmins Martelle Heritage Consultants Inc. (TMHC) was contracted to carry out a Stage I archaeological assessment for a new natural gas pipeline (the St. Laurent Ottawa North Replacement Pipeline Project) in the City of Ottawa by Dillon Consulting Limited (Dillon) who are coordinating the environmental assessment on behalf of Enbridge Gas Inc. (Enbridge). Enbridge is proposing multiple routes for the pipeline, the preliminary preferred route and alternative routes (RTE 1-9). The preliminary preferred route (Phase 4 Route 1) for the proposed natural gas pipeline originates at the Rockcliffe Control Station on Sir George Etienne Cartier Parkway and follows Aviation Parkway, Vanier Parkway, Cummings Avenue, Labelle Street, Michael Street, Belfast Road and Shore Street. Route 2 follows Cummings Avenue from Montreal Road to Ogilvie Road; Route 3 follows Montreal and St. Laurent Boulevard from Aviation Parkway to Rockcliffe Control Station; Route 4 follows Brittany Drive from Montreal Road to St. Laurent Boulevard; Route 5 follows Coventry Road, Vanier Parkway and Highway 417 from St. Laurent Boulevard to the Rideau River; Route 6 follows Queen Mary Street from St. Laurent Boulevard to North River Road; Route 7 follows Prince Albert Street from Alesther Street to North River Road; Route 8 follows Cyrville Road from Labelle Street to St. Laurent Boulevard; Route 9 follows Vanier Parkway, Presland Road and Drouin Avenue from Coventry Road to North River Road. Phase 3 of the pipeline consists of three portions, the north, central and southern. The northern portion overlaps with Route 3 and only diverges on Hillsdale Road. The central portion overlaps with Route 1 and 5 and only diverges along St. Laurent Boulevard between Donald Street and Highway 417. The southern portion follows Lancaster Road, Gladwin Crescent, Bourassa Street, St. Laurent Boulevard and Industrial Avenue and follows St. Laurent Boulevard from Donald Street to Highway 417, Ogilvie Road/Coventry Road from Cummings Avenue to just past Belfast Road.

The Stage I Project area was determined to be a 30 m wide study area on each side of the preliminary preferred route and the alternative routes to encompass any potential work areas that might be required. The Project area lies within part of Lots A, 1 to 5, 8 to 11 and 13 to 15, Junction Gore, Lots 23 to 26, Concession 1 on Ottawa River, Lots 26 and 27, Concession 2 on Ottawa River and Lots 26 and 27, Concession 3 on Ottawa River in the Geographic Township of Gloucester, City of Ottawa, County of Carleton, Ontario. All work was done in accordance with the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011).

The Stage I background study included a review of current land use, historic and modern maps, registered archaeological sites and previous archaeological studies, past settlement history for the area and a consideration of topographic and physiographic features, soils and drainage. The background research indicated that the Project area was in proximity to features signalling archaeological potential, namely: 1) watercourses (Rideau River and Ottawa River); 2) areas of 19th century settlement; 3) mapped 19th century thoroughfares (St. Laurent Boulevard, Hemlock Road, Montreal Road, Ogilvie Road, Cyrville Road, North River Road and Russel Road); and 4) Beechwood Cemetery and Notre Dame Cemetery.

Nonetheless, a review of historic mapping and aerial photographs, along with modern day imagery and proponent mapping, shows that the land within the majority of the Project area (67.1%; 270.59 ha) has been extensively disturbed by above and below ground utilities and previous construction activity. Two sections of the Project area (0.4%; 1.5 ha) along St. Laurent Boulevard are occupied by the Beechwood Cemetery and Notre Dame Cemetery. A large area (32.5%; 131.28 ha) within the Project area retains archaeological potential.



Based on the information compiled in the background study the following recommendation is made:

Preliminary Preferred Route 1 (Phase 4)

The majority of preliminary preferred route is free of archaeological concern; however, there are numerous large areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- The RCMP and Musical Ride Training Facility that consists of open green spaces;
- Hemlock Road – open green spaces and forested areas on both sides of Hemlock Road;
- Aviation Parkway – open green spaces and forested areas on both sides of Aviation Parkway;
- Ogilvie Road – the green spaces on the north and south side of Ogilvie Road at Aviation Parkway;
- Cummings Avenue between Ogilvie Road and Cyrville Road – two treed green spaces on the east and west side of Cummings Avenue; and
- Michael Street north of Highway 417 – a small area on the west side of the ROW consists of a green space overgrown with small trees and shrubs.

Route 2

Route 2 along Cummings Road should be considered free of archaeological concern and no further assessment is recommended.

Route 3

The majority of Route 3 along Montreal Road and St. Laurent Boulevard to Rockcliffe Control Station is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Montreal Road at Aviation Parkway - open green spaces and forested areas on the north and south side of Montreal Road; and
- Sandridge Road – the north and south side of Sandridge Road has been minimally disturbed.

Notre Dame Cemetery

The Notre Dame Cemetery boundaries are fenced, and a row of monuments stands immediately west of this fence adjacent to the ROW. As this cemetery is in the area associated with a 19th-century church, there is potential to be unmarked burials in the area. As such, a cemetery boundary investigation may be required for the ROW in this area; however, the specifics of this strategy should be developed after the completion of the Stage 2 survey of the area in consultation with the MTHCI, BAO, and cemetery operator if there is potential for the boundary area to be impacted.



Beechwood Cemetery

The Beechwood Cemetery boundaries are fenced and there are no markers close to the ROW. No known church is associated with the cemetery. As this cemetery was founded in 1873, there is potential to be unmarked burials in the area. As such, a cemetery boundary investigation may be required for the ROW in this area; however, the specifics of this strategy should be developed after the completion of the Stage 2 survey of the area in consultation with the MTHCI, BAO, and cemetery operator if there is potential for the boundary area to be impacted.

Route 4

Route 4 along Brittany Drive should be considered free of archaeological concern and no further assessment is recommended.

Route 5

The majority of Route 5 along Coventry Road is free of archaeological concern; however, there are several areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Coventry Road - a small lawn area at the northeast corner of Coventry Road and Lola Street, as well as a manicured lawn on the south side of Coventry Road at Belfast Road; and
- Highway 417 – two small grassed sections north of the highway and one small grassed section west of Riverside Drive.

Route 6

The majority of Route 6 along Queen Mary Street and North River Road is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- North River Road – western side of the road; and
- Queen Mary Street and North River Road Intersection – construction monitoring was recommended (Heritage Quest 2006)

Route 7

Route 7 along Prince Albert Street should be considered free of archaeological concern and no further assessment is recommended.

Route 8

Route 8 along Cyrville Road between Cummings Avenue and St. Laurent Boulevard should be considered free of archaeological concern and no further assessment is recommended.



Route 9

Route 9 along Vanier Parkway, Presland Road and Drouin Avenue should be considered free of archaeological concern and no further assessment is recommended.

Phase 3 – Northern Portion

The northern portion of the Phase 3 pipeline overlaps with Route 3 and only diverges on Hillsdale Road. The open grassed and treed areas along Hillsdale Road retain archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Hillsdale Road – any open grassed or treed area along Hillsdale Road.

Phase 3 – Central Portion

The central portion of the Phase 3 pipeline overlaps with Route 1 and 5 and only diverges along St. Laurent Boulevard between Donald Street and Highway 417. This portion should be considered free of archaeological concern and no further assessment is recommended.

Phase 3 – Southern Portion

The majority of the southern portion of Phase 3 along Lancaster Road, Gladwin Crescent, Bourassa Street, St. Laurent Boulevard and Industrial Avenue is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Lancaster Road – open grassed or treed area along the north and south side;
- Northwest corner of Lancaster Road and Gladwin Crescent – open grassed area; and
- South side of Bourassa Street – open grassed area.

Previously Assessed- Further Work Needed

Several previous archaeological assessments occurred within the current Project area, with two having outstanding recommendations. The first outstanding recommendations are for the intersection of Queen Mary Street and North River Road where construction monitoring was recommended (Heritage Quest 2006; Maps 8 and 35). The second is for the green space along the Rideau River, where it was recommended for Stage 2 assessment (Golder 2013; Maps 10 and 35).

Previously Assessed- No Further Work Needed

Several previous archaeological assessments occurred within the current Project area which meet current MHSTCI Standards and Guidelines (McGovern Heritage 2004; Heritage Quest 2006; ASI 2007; Golder 2013; Stantec 2018; TMHC 2018, 2019). As such, these areas should be considered as previously assessed at this time. If any of these areas are to be impacted, they should not be subject to Stage 2 archaeological assessment.

If the Project area is changed to incorporate lands not covered within this assessment, then additional archaeological assessment may be required.



These recommendations are subject to the conditions laid out in Section 7.0 of this report and to the Ministry of Heritage, Sport, Tourism and Culture Industries' review and acceptance of this report into the provincial registry.



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Tristan Lefler, Dillon Consulting Limited



I PROJECT CONTEXT

I.1 Development Context

I.1.1 Introduction

In the fall of 2019, Timmins Martelle Heritage Consultants Inc. (TMHC) was contracted to carry out a Stage I archaeological assessment for a new natural gas pipeline (the St. Laurent Ottawa North Replacement Pipeline Project) in the City of Ottawa by Dillon Consulting Limited (Dillon) who are coordinating the environmental assessment on behalf of Enbridge Gas Inc. (Enbridge). Enbridge is proposing multiple routes for the pipeline, the preliminary preferred route and alternative routes (RTE 1-9). The preliminary preferred route (Phase 4 Route 1) for the proposed natural gas pipeline originates at the Rockcliffe Control Station on Sir George Etienne Cartier Parkway and follows Aviation Parkway, Vanier Parkway, Cummings Avenue, Labelle Street, Michael Street, Belfast Road and Shore Street. Route 2 follows Cummings Avenue from Montreal Road to Ogilvie Road; Route 3 follows Montreal and St. Laurent Boulevard from Aviation Parkway to Rockcliffe Control Station; Route 4 follows Brittany Drive from Montreal Road to St. Laurent Boulevard; Route 5 follows Coventry Road, Vanier Parkway and Highway 417 from St. Laurent Boulevard to the Rideau River; Route 6 follows Queen Mary Street from St. Laurent Boulevard to North River Road; Route 7 follows Prince Albert Street from Alesther Street to North River Road; Route 8 follows Cyrville Road from Labelle Street to St. Laurent Boulevard; Route 9 follows Vanier Parkway, Presland Road and Drouin Avenue from Coventry Road to North River Road. Phase 3 of the pipeline follows Lancaster Road, Gladwin Crescent, St. Laurent Boulevard and Industrial Avenue and follows St. Laurent Boulevard from Donald Street to Highway 417, Ogilvie Road/Coventry Road from Cummings Avenue to just past Belfast Road.

The Stage I Project area was determined to be a 30 m wide study area on each side of the preliminary preferred route and the alternative routes to encompass any potential work areas that might be required. The Project area lies within part of Lots A, 1 to 5, 8 to 11 and 13 to 15, Junction Gore, Lots 23 to 26, Concession 1 on Ottawa River, Lots 26 and 27, Concession 2 on Ottawa River and Lots 26 and 27, Concession 3 on Ottawa River in the Geographic Township of Gloucester, City of Ottawa, County of Carleton, Ontario. All work was done in accordance with the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011).

All archaeological assessment activities were performed under the professional archaeological license of Matthew Beaudoin, PhD (P324) and in accordance with the 2011 *Standards and Guidelines for Consultant Archaeologists* (MTC 2011). Permission to commence the study was given by Alissa Lee, of Dillon.



1.1.2 Purpose and Legislative Context

The *Ontario Heritage Act* (1990) makes provisions for the protection and conservation of heritage resources in the province of Ontario. Our archaeological assessment work is part of an environmental review which is intended to identify areas of environmental interest as specified in the *Provincial Policy Statement* (2014). Heritage concerns are recognized as a matter of provincial interest in Section 2.6.2 of the *Provincial Policy Statement* (PPS) which states:

development and site alteration shall not be permitted on lands containing archaeological resources or areas of archaeological potential unless significant archaeological resources have been conserved (OMMAH 2014:29).

In the PPS the term conserved means:

the identification, protection, management and use of built heritage resources, cultural heritage landscapes and archaeological resources in a manner that ensures their cultural heritage value or interest is retained under the Ontario Heritage Act. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment and/or heritage impact assessment. Mitigative measures and/or alternative development approaches can be included in these plans and assessments (OMMAH 2014:40).

The *Environmental Assessment Act* provides for the protection and conservation of the environment. In this case, the environment is widely defined to cover “cultural heritage” resources. Section 5(3)(c) of the Act stipulates that heritage resources to be affected by a proposed undertaking be identified during the environmental screening process. Within the EA process, the purpose of a Stage I background study is to determine if there are known cultural resources within the proposed study area, or potential for such resources to exist. Subsequently, it can act as a planning tool by identifying areas of concern that, where possible, could be avoided to minimize environmental impact. It is also used to determine the need for a Stage 2 field assessment involving the search for archaeological sites.



2 STAGE I BACKGROUND REVIEW

2.1 Research Methods and Sources

A Stage I overview and background study was conducted to gather information about known and potential cultural heritage resources within the Project area. According to the *Standards and Guidelines*, a Stage I background study must include a review of:

- an up-to-date listing of sites from the Ontario Archaeological Sites Database (OASD) of archaeological sites within 1 km of the Project area;
- reports of previous archaeological fieldwork within a radius of 50 metres;
- topographic maps at 1:10,000 (recent and historical) or the most detailed scale available;
- historic settlement maps (e.g., historical atlas, surveys);
- archaeological management plans or other archaeological potential mapping (when available); and
- commemorative plaques or monuments on or near the Project area.

For this project, the following activities were carried out to satisfy or exceed the above requirements:

- a database search of registered archaeological sites within 1 km of the Project area was carried out with the Ministry of Heritage, Sport, Tourism and Culture Industries' Past Portal system (completed December 6, 2019);
- a review of known prior archaeological reports for the Project area and adjacent lands (note the Ministry of Heritage, Sport, Tourism and Culture Industries' currently does not keep a publicly accessible record of archaeological assessments carried out in the Province of Ontario, so a complete inventory of prior assessment work nearby is not available);
- Ontario Base Mapping (1:10,000) was reviewed through ArcGIS and mapping layers provided by geophyenetwork.ca; detailed mapping provided by the client was also reviewed; and,
- historic maps and records related to post-1800 land settlement were studied.

Additional sources of information were also consulted, including modern aerial photographs, local history accounts, soils and physiography data provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), and both 1:50,000 (Natural Resources Canada) and finer scale topographic mapping.

There are no commemorative plaques or monuments within the vicinity of the Project area. The Project area falls within the Regional Municipality of Ottawa-Carleton's Archaeological Management Plan (ASI and Geomatics 1999); which identifies part of the Project area as having archaeological potential.

When compiled, background information was used to create a summary of the characteristics of the Project area, to evaluate its archaeological potential. The Province of Ontario (MTC 2011 – Section 1.3.1) has defined the criteria that identify archaeological potential as:

- previously identified archaeological sites;
- water sources;
 - primary water sources (lakes, rivers, streams, creeks);
 - secondary water courses (intermittent streams and creeks, springs, marshes, swamps);
 - features indicating past water sources (e.g., 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 topography, shorelines of drained lakes or marshes, cobble beaches);



- accessible or inaccessible shoreline (e.g., high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh);
- elevated topography (e.g., eskers, drumlins, large knolls, plateau);
- 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 (e.g., migratory routes, spawning areas, prairie);
 - scarce raw materials (e.g., quartz, copper, ochre or outcrops of chert);
 - early Euro-Canadian industry (e.g., fur trade, logging, prospecting, mining)
- areas of 19th century settlement. These include places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries. There may be commemorative markers of their history, such as local, provincial, or federal monuments or heritage parks.
- early historical transportation routes (e.g., trails, passes, roads, railways, portage routes);
- property listed on a municipal register or designated under the *Ontario Heritage Act* or that is a federal, provincial, or municipal historic landmark or site; and
- property that local histories or informants have identified with possible archaeological sites, historical events, activities or occupations.

In Southern Ontario (south of the Canadian Shield), any lands within 300 m of any of the features listed above are considered to have potential for the discovery of archaeological resources.

Typically, a Stage I assessment will determine potential for Indigenous and historic era sites independently. This is due to the fact that lifeways varied considerably during these eras so that criteria used to evaluate potential for each type of site also varies.

It should be noted that some factors can also negate the potential for discovery of intact archaeological deposits. Subsection 1.3.2 of the 2011 *Standards and Guidelines for Consultant Archaeologists* indicates that archaeological potential can be removed in instances where land has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. Major disturbances indicating removal of archaeological potential include, but are not limited to:

- quarrying;
- major landscaping involving grading below topsoil;
- building footprints; and,
- sewage and infrastructure development.

Some activities (agricultural cultivation, surface landscaping, installation of gravel trails, etc.) may result in minor alterations to the surface topsoil but do not necessarily affect or remove archaeological potential. It is not uncommon for archaeological sites, including structural foundations, subsurface features and burials, to be found intact beneath major surface features like roadways and parking lots. Archaeological potential is, therefore, not removed in cases where there is a chance of deeply buried deposits, as in a developed or urban context or floodplain where modern features or alluvial soils can effectively cap and preserve archaeological resources.



2.2 Project Context: Archaeological Context

2.2.1 Project Area: Overview and Physical Setting

The proposed natural gas pipeline originates on Sir George Etienne Cartier Parkway and runs to Lancaster Road, encompassing numerous major roads and side streets (Maps 1 and 2). As the Project is in the planning stages, there are no detailed development plans at this time and no effort was made to depict the result of the Stage I work on proponent mapping. Enbridge is proposing multiple routes for the pipeline, the preliminary preferred route and alternative routes (RTE 1-9). The preliminary preferred route (Phase 4 Route 1) for the proposed natural gas pipeline originates at the Rockcliffe Control Station on Sir George Etienne Cartier Parkway and follows Aviation Parkway, Vanier Parkway, Cummings Avenue, Labelle Street, Michael Street, Belfast Road and Shore Street. Route 2 follows Cummings Avenue from Montreal Road to Ogilvie Road; Route 3 follows Montreal and St. Laurent Boulevard from Aviation Parkway to Rockcliffe Control Station; Route 4 follows Brittany Drive from Montreal Road to St. Laurent Boulevard; Route 5 follows Coventry Road, Vanier Parkway and Highway 417 from St. Laurent Boulevard to the Rideau River; Route 6 follows Queen Mary Street from St. Laurent Boulevard to North River Road; Route 7 follows Prince Albert Street from Alesther Street to North River Road; Route 8 follows Cyrville Road from Labelle Street to St. Laurent Boulevard; Route 9 follows Vanier Parkway, Presland Road and Drouin Avenue from Coventry Road to North River Road. Phase 3 of the pipeline follows Lancaster Road, Gladwin Crescent, St. Laurent Boulevard and Industrial Avenue and follows St. Laurent Boulevard from Donald Street to Highway 417, Ogilvie Road/Coventry Road from Cummings Avenue to just past Belfast Road. The proponent direction was that the Project area was to be primarily restricted to the existing ROW, with the possibility that there may be some minor work areas adjacent to the ROW if required. As such, the Project area was established to extend 30 m beyond the edge of the ROW to encompass any potential work areas along the corridor .

The Project area lies within the Ottawa Valley Clay Plains physiographic region, as defined by Chapman and Putnam (1942:205-209; Map 3). The Ottawa Valley Clay Plains are a vast clay plain that extends along the shore of the Ottawa River. The majority of the Project area is located within a clay plain region; however, the northern portion of the Project area is located within a sand plain. These clay plains were formed through sediment deposition associated with the retreating Laurentide ice sheet and the waters of the Champlain Sea. As the Project area occurs within the core of the City of Ottawa, the soils within the Project area are all classified as urban.

Lands in the vicinity of the Project area are drained by the Rideau and Ottawa Rivers. Several artificial drains, small wetlands and McKay Lake are present within the Project area (Map 4). It is reported by the Algonquins of Ontario (AOO) that there is a former stream that flows underneath St. Laurent Boulevard.



2.2.2 Summary of Registered or Known Archaeological Sites

According to the Ontario Archaeological Sites Database (OASD) maintained by the Ministry of Heritage, Sport, Tourism and Culture Industries, there are nine registered archaeological sites within 1 km of the Project area. The majority of these sites were identified during CRM assessments of the surrounding lands prior to development activities. Only one site, BiFv-15, is located within 300 m of the current Project area. BiFv-15 is located roughly 290 m east of the Project area and is discussed in further detail below.

The lack of registered archaeological sites in the vicinity of the Project area is more reflective of the lack of archaeological assessments in the area instead of an absence of Indigenous land use. This portion of Ottawa was urbanized relatively early and developed before archaeological assessments were part of the development approval process. There are significantly more registered sites on the western side of the Rideau River. The majority of the sites identified within the vicinity of the Project area are 19th-century sites associated with farmsteads (BiFv-15, BiFv-16, BiFv-18, and BiFw-102) or Rideau Hall (BiFw-22 and BiFw-56). The closest Indigenous sites are Rockcliffe Portage 1 (BiFw-91) and Rockcliffe Portage 2 (BiFw-92), which were two Indigenous landing spots studied by Jean-Luc Pilon of the Canadian Museum of Civilization (Pilon 2008). Despite that only limited archaeological investigations were completed and that both sites were partially impacted by more modern activities, Pilon interpreted these sites as boat landings that were in areas that minimally post-dated 4700 B.P.

Table 1: Sites within 1 km of Project Area

Borden Number	Site Name	Time Period	Affinity	Site Type	Current Development Review Status
BiFw-11	Marlborough Avenue	Indigenous	Indigenous	Isolated find	No CHVI
BiFw-102	The Devlin Residence Site	Post-Contact	Euro-Canadian		
BiFv-18	Lower Lang	Post-Contact	Euro-Canadian	farmstead	CHVI
BiFv-17	Bareille-Snow	Post-Contact	Euro-Canadian	farmstead	CHVI
BiFv-16	Lang	Post-Contact	Euro-Canadian	farmstead	CHVI
BiFv-15	McLaughlin	Post-Contact	Euro-Canadian	farmstead	No CHVI
BiFv-1	Graham Farm	Post-Contact	Euro-Canadian	Homestead	No CHVI
BiFv-10	Little Farmstead	Post-Contact	Euro-Canadian	farmstead	No CHVI



2.2.3 Summary of Past Archaeological Investigations within 50 m

During our background review it was established that nine archaeological projects had taken place within 50 metres of the Project area. As the Province does not currently maintain an accessible database of archaeological assessment areas per se, it is not known whether this is a complete inventory of archaeological assessment activities undertaken within 50 metres of the Project area.

In 1999, Archaeological Services Inc. (ASI) conducted a Stage I archaeological assessment for the former CFB Rockcliffe airbase in the City of Ottawa. The Stage I concluded that the majority of the property has been impacted by the development of the airbase, but several green space areas might retain archaeological potential. At the time of the production of the current report, we were unable to obtain a copy of this report.

In 2004, McGovern Heritage Archaeological Associates conducted a Stage 2 archaeological assessment for a proposed storm sewer pipe replacement in Lot A, Concession Junction Gore in the City of Ottawa (Map 5). The assessment consisted of a test pit survey at 5 m intervals for three potential sewer alignments. The survey did not result in the identification of any archaeological material. The results of this work are presented in a report entitled *Stage 2 Archaeological Assessment of the Proposed Birch Easement Storm Sewer Outfall Rehabilitation Project. Part Lot A, Concession Junction Gore, Geographic Township of Gloucester, City of Ottawa* (McGovern Heritage Archaeological Associates 2004; Licensee Hugh Daechsel; PIF# P05I-026).

In 2006, Heritage Quest Inc. conducted a Stage 2 assessment for the installation of a new sewer line in the City of Ottawa. The corridor runs along North River Road from Montreal Road to Wright Street (Maps 6 and 7). Two staging areas at the north and south end of the corridor were also assessed. The previous Stage I assessment for this project indicated that the entire corridor had archaeological potential. The Stage 2 assessment consisted of a test pit survey at 5 m intervals. No archaeological material was identified during the Stage 2 assessment. The results of this work are presented in a report entitled *Stage 2 Archaeological Assessment, Rideau River Collector, North River Road, Lots 7, 8, 9 & 10, The Junction Gore, Geographic Township of Gloucester, City of Ottawa* (Heritage Quest 2006; Licensee Hugh Daechsel; PIF# P05I-98-2006).

Also in 2006, Heritage Quest Inc. conducted a Stage I assessment for planned road, sewer and watermain construction along Queen Mary Street from North River Road to Edith Street (Map 8). The Stage I assessment indicated that the majority of the study area had been previously disturbed and does not retain archaeological potential. The intersection of Queen Mary Street and North River Road was recommended for construction monitoring. The results of this work are presented in a report entitled *Stage I Archaeological Assessment, Queen Mary Street From North River Road to Edith Street, Lot 9, The Gore Junction, Geographic Township of Gloucester, City of Ottawa* (Heritage Quest 2018; Licensee Hugh Daechsel; PIF# P05I-100-2006).

In 2007, ASI conducted a Stage 2 archaeological assessment for the former CFB Rockcliffe airbase in the City of Ottawa. The property is approximately 135 hectares in size and was subject to test pit survey at 5 m interval (Map 9). Four archaeological sites were identified during the survey (BiFv-15, BiFv-16, BiFv-17 and BiFv-18). All four are 19th century sites, and three (BiFv-16, BiFv-17 and BiFv-18) were recommended for Stage 3 assessment. The results of this work are presented in a report entitled *Stage 2 Archaeological Assessment of the Former CFB Rockcliffe Airbase, City of Ottawa* (ASI 2007; Licensee Shaun Austin; PIF# P14I-107-2007 and P14I-111-2007).

In 2012, Golder Associates Inc. (Golder) conducted a Stage I and 2 assessment for a proposed staging area for rehabilitation work on Highway 417 and the Hurdman Bridge (Map 10). The assessment consisted of test pit survey at 5 and 10 m intervals. A total of 19 20th century artifacts were recovered. The study area was heavily



disturbed due to utilities, infrastructure and modern fill. The results of this work are presented in a report entitled *Stage 1 and 2 Archaeological Assessment, Hurdman Bridge Highway 417 Staging Areas (MTO GWP 4091-07-000 & GWP 4320-06-00), Part Lot G, Concession D, Former Geographic Township of Nepean and Part Lot 11, Junction Gore, Former Geographic Township of Gloucester, City of Ottawa* (Golder 2012; Licensee Ibrahim Noureddine; PIF# P350-013-2012).

In 2013, Golder conducted a Stage 1 assessment for a potential watermain installation along Coventry Road, Drouin Avenue, Wright Street and North River Road (Map 11). Only the proposed watermain alignment was subject to assessment. The Stage 1 assessment indicated that the majority of the study area had been previously disturbed and does not retain archaeological potential. The green space along the Rideau River was recommended for Stage 2 assessment. No evidence of a Stage 2 assessment was found. The results of this work are presented in a report entitled *Stage 1 Archaeological Assessment, Orleans Watermain Link (OWL) West, Part of Lots 9, 10 and 11, Junction Gore, Part of Lots 25, Concession 1 and Part of Lot 27, Concession 2, Ottawa Front, Former Geographic Township of Gloucester, City of Ottawa* (Golder 2013; Licensee Ibrahim Noureddine; PIF# P350-022-2012).

In 2018, Stantec Consulting Ltd. (Stantec) conducted a Stage 2 assessment for a new pumping station on Brittany Drive in the City of Ottawa (Map 12). A previous Stage 1 assessment concluded that the area retained archaeological potential and a Stage 2 assessment was recommended. The Stage 2 assessment consisted of test pit survey at a 5 m interval and photo-documentation of disturbances. No archaeological material was identified during the Stage 2 assessment. The results of this work are presented in a report entitled *Stage 2 Archaeological Assessment: Brittany Drive Pumping Station, Part of Lot 25, Concession 1 on Ottawa River, Geographic Township of Gloucester, former Carleton County, Now City of Ottawa, Ontario* (Stantec 2018; Licensee Patrick Hoskinks; PIF# P415-0162-2018).

In 2019, TMHC was contracted to carry out a Stage 1 archaeological assessment for a 1.7 km natural gas pipeline in the City of Ottawa, Ontario (Map 13). The preferred route for the proposed natural gas pipeline originates approximately 20 m south of Donald Street at St. Laurent Boulevard, continuing north on St. Laurent Boulevard for approximately 1.7 km where it will terminate approximately 20 m north of Montreal Road. All proposed segments of pipe are to be installed within the existing municipal ROW. The Stage 1 Project area was determined to be a 50 m wide study area centred on St. Laurent Boulevard. The Project area fell within part of Lots 5, 6, 7, and 8 Junction Gore and Lot 26, Concession 1 on Ottawa River in the Geographic Township of Gloucester, City of Ottawa, County of Carleton, Ontario. The Stage 1 assessment also determined that the majority of the Project area has been previously extensively disturbed by above and below ground utilities and previous development. Despite this, a small series of areas containing manicured lawns were found to contain archaeological potential, and a Stage 2 archaeological assessment was recommended for these areas. Additionally, a section of the Stage 1 Project area at the northwestern corner of the intersection of Montreal Road and St. Laurent Boulevard is occupied by the Notre Dame Cemetery. As such, the recommendations stated that a cemetery boundary investigation may be required for the ROW in this area. As the cemetery fencing immediately abuts the sidewalk and paved roadway, Stage 2 test pit survey and mechanical trenching is not feasible. Therefore, construction monitoring would be required in this area. The Stage 2 Project area does not include lands within the ROW in this area; the preferred route falls within the eastern side of St. Laurent Boulevard in this section and does not include lands adjacent to the cemetery. The results of this work are presented in a report entitled *Stage 1 Archaeological Assessment, St. Laurent Pipeline Project, Enbridge Gas Inc., Part of lots 5, 6, 7 and 8, Junction Gore and Part of Lot 26, Concession 1 on Ottawa River,*



Geographic Township of Gloucester, Carleton County, City of Ottawa, Ontario (TMHC 2019a; Licensee Matthew Beaudoin; PIF# P324-0375-2019).

In the summer of 2019, TMHC conducted the Stage 2 assessments for the areas of archaeological potential identified during the Stage I assessment for the St. Laurent Boulevard Pipeline project (Maps 14 to 17). The area (approximately 0.0086 ha) was subject to a judgemental test pit survey at a 10 m interval and the remainder of the Project was photo-documented. No archaeological material was identified during the Stage 2 assessment. The results of this work are presented in a report entitled *Stage 2 Archaeological Assessment, St. Laurent Pipeline Project, Enbridge Gas Inc., Part of lots 5, 6, 7 and 8, Junction Gore and Part of Lot 26, Concession 1 on Ottawa River, Geographic Township of Gloucester, Carleton County, City of Ottawa, Ontario (TMHC 2019b; Licensee Matthew Beaudoin; PIF# P324-0396-2019).*

2.2.4 Dates of Archaeological Fieldwork

The Stage I property inspection was conducted on November 25, 26, and 27, 2019, under cool and overcast weather conditions. The field director was Ramsay Macfie.



2.3 Project Context: Historical Context

2.3.1 Indigenous Settlement in the Project Area

There is archaeological evidence of Indigenous settlement within the Ottawa Region since the time of glacial retreat some 12,000 years ago through to the modern era. Nonetheless, our knowledge of past Indigenous land use in the area is incomplete due primarily to a lack of archeological investigation of many areas prior to urban development. Nonetheless, using province-wide and region-specific data, a general model of Indigenous settlement in the area can be proposed. The following paragraphs provide a basic textual summary of the known general cultural trends and archaeological periods and a tabular summary appears in Table 2.

Table 2: Chronology of Indigenous Settlement in Eastern Ontario

Period	Time Range	Diagnostic Features	Archaeological Complexes
Early Paleo	9000-8400 BCE	fluted projectile points	Gainey, Barnes, Crowfield
Late Pale	8400-8000 BCE	non-fluted and lanceolate points	Holcombe, Hi-Lo, Lanceolate
Early Archaic	8000-6000 BCE	serrated, notched, bifurcate base points	Nettling, Bifurcate Base Horizon
Middle Archaic	6000-2500 BCE	stemmed, side & corner notched points	Brewerton, Otter Creek, Stanly/Neville
Late Archaic	2000-1800 BCE	narrow points	Lamoka
Late Archaic	1800-1500 BCE	broad points	Genesee, Adder Orchard, Perkiomen
Late Archaic	1500-1100 BCE	small points	Crawford Knoll
Terminal Archaic	1100-950 BCE	first true cemeteries	Hind
Early Woodland	950-400 BCE	expanding stemmed points, Vinette pottery	Meadowood
Middle Woodland	400 BCE-500 CE	dentate, pseudo-scallop pottery	Saugeen/Couture
Transitional Woodland	500-900 CE	first corn, cord-wrapped stick pottery	Princess Point/Sandbanks Tradition
Late Woodland	900-1300 CE	first villages, corn horticulture, longhouses	Glen Meyer
Late Woodland	1300-1400 CE	large villages and houses	Uren, Middleport
Late Woodland	1400-1650 CE	tribal emergence, territoriality	
Contact Period - Indigenous	1700 CE-present	treaties, mixture of Indigenous & European items	
Contact Period - Settler	1796 CE-present	industrial goods, homesteads	pioneer life, municipal settlement



2.3.1.1 Paleo Period

The first human populations to inhabit the region arrived between 12,000 and 10,000 years ago, coincident with the end of the last period of glaciation. Climate and environmental conditions were significantly different than they are today; local environs would not have been welcoming to anything but short-term settlement. Termed Paleoindians by archaeologists, Ontario's first peoples would have crossed the landscape in small groups (i.e., bands or family units) searching for food, particularly migratory game species. In this area, caribou may have provided the staple of Paleoindian diet, supplemented by wild plants, small game, birds and fish.

Given the low density of populations on the landscape at this time and their mobile nature, Paleo sites are small and ephemeral. They are sometimes identified by the presence of fluted projectile points manufactured on a highly distinctive whitish-grey chert named "Fossil Hill" (after the formation) or "Collingwood." This material was acquired from sources near the edge of the escarpment on Blue Mountain. It was exploited by populations from as far south as the London area, who would have traveled to the source as part of their seasonal round.

Many of the earliest evidence for Paleo period peoples are located along glacial beaches, ridges, and relic shoreline. Several sites have been identified within the Rideau Lakes region to the west (Watson 1990); however, it should be emphasized that sites that date to this period are extremely rare and significant.

2.3.1.2 Archaic Period

Settlement and subsistence patterns changed significantly during the Archaic Period as both the landscape and ecosystem adjusted to the retreat of the glaciers. Building on earlier patterns, early Archaic populations continued the mobile lifestyle of their predecessors. Through time and with the development of more resource rich local environments, these groups gradually reduced the size of the territories they exploited on a regular basis. A seasonal pattern of warm season riverine or lakeshore settlements and interior cold weather occupations has been documented in the archaeological record.

Since the large cold weather mammal species that formed the basis of the Paleoindian subsistence pattern became extinct or moved northward with the onset of warmer climate conditions, Archaic populations had a more varied diet, exploiting a range of plant, bird, mammal and fish species. Reliance on specific food resources like fish, deer and nuts becomes more pronounced through time and the presence of more hospitable environments and resource abundance led to the expansion of band and family sizes. In the archaeological record, this is evident in the presence of larger sites and aggregation camps, where several families or bands would come together in times of plenty. The change to more preferable environmental circumstances led to a rise in population density. As a result, Archaic sites are more plentiful than those from the earlier period. Artifacts typical of these occupations include a variety of stemmed and notched projectile points, chipped stone scrapers, ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets), bifaces or tool blanks, animal bone (where and when preserved) and waste flakes, a by-product of the tool making process.

2.3.1.3 Early, Middle and Transitional Woodland Periods

Significant changes in cultural and environmental patterns are witnessed in the Woodland Period (circa 3,000 to historic times). By this time, the coniferous forests of earlier times were replaced by stands of mixed and deciduous species. Occupations became increasingly more substantial in this period, culminating in major semi-permanent villages by 1,000 years ago. Archaeologically, the most significant changes by Woodland times are the appearance of artifacts manufactured from modeled clay and the construction of house structures. The



Woodland Period is often defined by the occurrence of pottery, storage facilities and residential areas similar to those that define the incipient agricultural or Neolithic period in Europe.

Early and Middle Woodland peoples are also known for a well-developed burial complex and ground stone tool industry. Unique Early Woodland ground stone items include pop-eyed birdstones and gorgets. In addition, there is evidence of the development of widespread trading with groups throughout the northeast. The recovery of marine shells from the Lake Superior area indicates that exchanges of exotic materials and finished items from distant places were common place. The Middle Woodland period in the region is dominated by sites recognized as part of the Point Peninsula archaeological complex. Point Peninsula groups were influenced by Hopewell culture developments in the American Midwest, including mound burial and participation in widespread trade in exotic materials, many of which were used as burial offerings.

2.3.1.4 Late Woodland Period

In Eastern Ontario Late Woodland development saw continued use of the region by groups retaining a hunter and gatherer-based subsistence strategy. It would seem that portions of Eastern Ontario such as the Ottawa Valley featured an overlap of this subsistence practice with that of limited horticulture. Essentially, hunter/gatherers in the region are primarily regarded as Algonquian speaking populations continuing a way of life extending from the Archaic period. Historically some of these groups were known as the Matouweskari, the Iroquet and the Kichesipirini. How these groups relate to ancestral populations such as those of the Point Peninsula complex remains a matter for debate. Understanding the prehistoric development of these groups has been hampered by a low intensity of archaeological activity. The following discussion will focus on developments in eastern Ontario that took place along the St. Lawrence River and the eastern shore of Lake Ontario.

The Late Woodland Period has been divided into three sub-periods consisting of Early, Middle and Late. Elements of all three are represented in Eastern Ontario although their relationship with one another is not as clearly defined as sequences emerging in southcentral and southwestern Ontario.

It is on Early sites that the first definitive house structures have been identified in Eastern Ontario. It is believed that there were earlier house structures but to date none have been identified in the region. Houses were small elliptical structures, much like Middle Woodland houses recorded in southwestern and northern Ontario, only slightly larger, with hearths placed off the centre line. It is during this part of the sequence that evidence of villages occurs, first as loosely associated structures followed by structures with more systematic organization of space, such as the designation of midden or garbage areas. In eastern Ontario evidence for Early villages is lacking. Many of the sites, such as Lakeshore Lodge in Prince Edward County, or the Kingston Outer Station, are fishing stations, a continuation of the Late Middle Woodland and Transitional Period settlement pattern. While there is some evidence for use of cultivated plants, it has been suggested that Early groups in Eastern Ontario still relied primarily on a hunter-gatherer subsistence strategy. Sites in areas such as Charleston Lake (Jackson's Point Rock Shelter) near Gananoque do suggest some differences between Point Peninsula and Pickering hunting and gathering patterns, indicating the same places were being used but at different seasons.

The Middle period, which dates between ca. A.D. 1300 and 1400, saw continued change in settlement patterns and subsistence practices among Late Woodland populations. These differences are considered part of a continuum involving in situ development of local populations. Middle period sites are rare in Eastern Ontario, but they have been identified in Prince Edward County and in the Kingston area. There is a Middle Iroquoian component at Kingston Outer Station, a fishing camp located along the Cataraqui River in Kingston. Middle



period ceramics have also been recovered from the Gananoque River Drainage System. These groups appear to have developed into the easternmost branches of the Huron-Wendat, discussed in greater detail below.

To the east, along the St. Lawrence Valley, were the St. Lawrence Iroquois. Village clusters have been identified at Prescott and further east towards Cornwall in Eastern Ontario, with a large number reported for Jefferson County in New York State and farther east in Quebec.

The material culture of the Huron-Wendat and the St. Lawrence Iroquois was similar in many ways. The St. Lawrence Iroquoian populations are distinguished from the Huron-Wendat by distinctive ceramic styles and the development of an extensive bone tool technology. The St. Lawrence Iroquoian lithic industry was very poorly developed, mainly because local stone sources were of low quality for tool manufacture. This may also have been a consequence of disruption of earlier trading networks that brought in better quality cherts. There is also some indication of conflict between these populations. In addition to village sites, fishing camps along tributaries of the St. Lawrence River have been found at Morrisburg and between Cardinal and Prescott. It has been suggested that these fishing camps serviced the inland sites by harvesting eel, an important element in the diet of St. Lawrence Iroquois populations.

There is considerable evidence to suggest that there was conflict between different populations or groups through this period. The appearance of St. Lawrence Iroquois ceramics on Huron-Wendat sites in Prince Edward County and in the Trent River System, as well as the recovery of Huron-Wendat ceramics on St. Lawrence Iroquoian sites has been explained in various ways, ranging from trade to warfare to wholesale migration and relocation of St. Lawrence Iroquois groups. We know that by the mid-1500s, after the visits by Jacques Cartier, the St. Lawrence Iroquoians had disappeared from the region. There is one site in the Trent Valley, within Huron-Wendat territory, that has yielded St. Lawrence Iroquoian pottery in association with European trade goods, suggesting that at least some of the St. Lawrence Iroquoians ultimately settled among the Huron-Wendat.

The Algonquian peoples have a long history of settlement in the Ottawa Valley that can be traced back to at least 8,000 years ago. Within the more recent period, Samuel de Champlain and other French explorers and traders arrived in the Ottawa region c. 1600, the Algonquins were established along the Ottawa River and its tributary valleys. These early contacts developed into a longer-term relationship during the fur trade era that crossed what is now the Ontario-Quebec border. This relationship was formalized through treaties and involved the participation of sharing of economic and military resources in the area to assist with conflict with the Iroquoian and English allies.

During conflicts in the early 17th-century, the French were not able to support their Algonquian allies during conflicts with the Iroquois and the Algonquin and Montagnais populations were driven from upper St. Lawrence region. Upon the return of the French support after 1632, the access to firearms was restricted by the Jesuits to Christian converts, which limited the support provided to the Algonquin peoples which were driven further north in the late 1630s. Algonquin peoples still inhabited the Ottawa Valley into the 1650s but were harried by Iroquois war parties into the 1660s, but hostilities with the Iroquois and British allies continued until peace was attained in 1667 after coordinated attacks on Iroquois villages in their homeland.

This peace ushered in a period of return to the Ottawa Valley and relative stability. The efforts of the French missionaries during this period brought Algonquin peoples into contact with various Christianised Indigenous peoples and new French allies, who were until recently were considered enemies. This stability continued until the Seven Years' War (1755-63) which saw the end of the French trade in the region and the rise of the British colonial rule. Treaties and agreements were made with the British representatives; however, in 1783



the British government purchased large portions of Eastern Ontario from Mississauga peoples, a trend which culminated in the 1822 purchase of lands surrounding the Ottawa Valley. In both instances the Algonquin peoples were not consulted. As such, the Algonquin have not surrendered their claim to these areas and contest the terms of these land sales.

2.3.2 Eighteenth and Nineteenth-Century and Municipal Settlement

The Project area lies within part of Lots A, 1, to 5, 8, to 11, 13 to 15, Junction Gore, Lots 23 to 26, Concession 1 on the Ottawa River, Lots 26 and 27, Concession 2 on the Ottawa River and Lots 26 and 27, Concession 3 on the Ottawa River in the Geographic Township of Gloucester, City of Ottawa, County of Carleton, Ontario. A brief discussion of 18th and 19th century and municipal settlement in Gloucester is provided below, as a means of providing general context for understanding former land use.

2.3.2.1 Gloucester Township

Gloucester Township was established in 1792 as Township B. It was originally part of Russell County but joined Carleton County in 1838 and was incorporated as Gloucester Township in 1850 (Walker & Walker 1968). Gloucester Township is bounded by the Rideau River to the west, the Ottawa River to the north, on the south by Osgoode Township and on the east by Russell County.

The first documented permanent settler in the township was Braddish Billings. Born in Massachusetts, he was raised in Brockville, Ontario, after the family settled there in 1792 (Belden & Co. 1879:xxxvi). As a young man, Braddish worked for Philemon Wright in the lumber industry before branching out on his own. He built a shanty on Lot 17 in the Junction Gore in 1812 and eventually claimed Lots 16 and 18 as well. The community of Billings Bridge was named for the bridge that linked Gloucester to Bytown. Billings initiated the construction of the bridge in c.1830, and it was funded by Braddish and nine other Gloucester residents (Walker & Walker 1968:168). Thomas Mackay, another prominent figure in Gloucester's history, also settled in Junction Gore. Junction Gore was nestled by both the Rideau and Ottawa Rivers, which made it a desirable location for settlement. A surge in settlement in the Rideau Front came after the completion of the Rideau Canal in 1832 when workers decided to settle instead of returning home to Ireland. The bank of the Rideau River was the preferred option, and settlement spread inland from there (Kemp 1991). The village of Hawthorne, centered at the intersection of Walkley and Russell Roads, was so named in 1873 with the establishment of a post office. Hawthorne was one of three communities on Russell Road that was founded in the early 1830s (Belden & Co. 1879:xxxvi) and a school was depicted there on the 1863 Walling map.

The 1863 Walling map of East Carleton County depicts a numerous structures within and adjacent to the Project area (Map 18). Names are present associated with the structures in some instances. Table 3 lists the occupants associated with each lot and concession within the Project area. St. Laurent Boulevard, Montreal Road, Ogilvie Road, Cyrville Road, North River Road and Russel Road are depicted as open at this time. A railroad is also present running adjacent to the Rideau River.

By 1879 the Project area is within the growing City of Ottawa (Map 19). By this time more roadways have been established and many lots have been subdivided. Table 4 lists the occupants associated with each lot and concession within the Project area. It should be noted that by this time the Notre Dame Roman Catholic Church and Cemetery are now depicted to the northwest of the intersection of Montreal Road and St. Laurent Boulevard and Beechwood Cemetery is located in Lot 3, Junction Gore. St. Laurent Boulevard,



Hemlock Road, Montreal Road, Ogilvie Road, Cyrville Road, North River Road and Russel Road are depicted as open at this time.

A review of the 1928 aerial photography shows that the lands within the Project area are primarily agricultural in nature (Map 20). Only a portion of the Project area is present on the 1928 historic aerial photograph. Some residential development is present in the western portion of the Project area along Queen Mary and Prince Albert Streets.

A review of the 1935 aerial photography shows that the lands within the Project area has been significantly developed, including along St. Laurent Boulevard, Queen Mary Street and Prince Albert Street (Map 21). Only the central portion of the Project area is depicted on the 1935 historic aerial photograph.

A review of the 1965 aerial photography shows that the lands within the majority of the Project area have been developed with residential or commercial buildings (Maps 22 and 23). The northern portion of the Project area has not been extensively developed and still contains open land. Rockcliffe Airport is present, but in a different configuration. The majority of the streets within the Project area have been built by this time, with the exception of Sir George Etienne Cartier Parkway, part of Cummings Ave, part of Coventry Road, Industrial Avenue, Gladwin Crescent and Lancaster Road. The southern portion of the Project area including Industrial Avenue, Gladwin Crescent and Lancaster Road are open field at this time. The boundaries of the Notre Dame Cemetery and Beechwood Cemetery are present at this time.

A review of the 1976 aerial photography shows that the lands within the majority of the Project area have been heavily developed with residential or commercial buildings (Maps 24 and 25). All roads with the exception of Sir George Etienne Cartier Parkway and Aviation Parkway north of Montreal Road have been built by this time.

Aerial photography from 2002 illustrates that Sir George Etienne Cartier Parkway and Aviation Parkway north of Montreal Road have been constructed, and Rockcliffe Airport has been significantly reduced (Maps 26 and 27). The remainder of the Project area is heavily developed. Aerial photography from 2015 also illustrates that the Project area has been heavily developed with residential, commercial and industrial buildings (Maps 28 and 29).

2.3.2.2 Beechwood Cemetery

Beechwood Cemetery was founded in 1873, on part of land from the original McPhail farm and Mackay estates. It was established outside of the city limits of Ottawa and was originally an Anglo-Protestant cemetery. The cemetery became the home of the National Military Cemetery of the Canadian Forces and was recognized as a National Historic Site in 2001. In 2004 it became home of the RCMP National Memorial Cemetery.

2.3.2.3 Notre Dame Roman Catholic Cemetery Land Use

The Notre Dame Cemetery is an active cemetery that is located to the northwest corner of St. Laurent Boulevard and Montreal Road. A fence stands west of the St. Laurent Boulevard sidewalk at the top of a slope which leads down to the cemetery grounds. Monuments are present almost immediately beside this slope.

The Notre Dame Cemetery is the oldest and largest Catholic cemetery in Ottawa. In 1848 Eugène Guigues, 1st Bishop of Ottawa, purchased 20 hectares of land from Mr. Bradley for the use as a Catholic cemetery. The need for burial space arose as a result of the closure of Ottawa's Lower Town cemeteries (Barracks Hill



Cemetery, 1788-1844; and Sandy Hill Cemetery, 1844-1872). Georges Bouillon was tasked with planning the new cemetery and on May 1st, 1872, the grounds were consecrated, and the cemetery was officially opened.

The Project area also abuts the Rockcliffe Park Conservation District. It is located south of Sandridge Road to Hemlock Road and from Birch Avenue to Lisgar Road. Rockcliffe Park was subdivided by Thomas Keefer in 1864. The land was originally part of the estate of his father-in-law, Thomas MacKay. Early buildings in Rockcliffe Park were used as summer cottages but by 1908 a police village had been established and in 1926 the Village of Rockcliffe Park was incorporated. Today, the former Village of Rockcliffe Park is part of the city of Ottawa but retains its distinct village character (City of Ottawa).



Table 3: 1863 County Map Lot and Concession Information

Lot	Conc.	Name	Structure?	Portion	Notes
A	Gore	Dr. Rob Hunter	Yes	All	Outside PA
1	Gore	T. McKay	Yes	All	Outside PA
2	Gore	P.M.	Yes	All	Outside PA
3	Gore	H. McPhail	Yes	East ½	Outside PA
4	Gore	No name	No	All	n/a
5	Gore	No name	Yes	All	Inside PA
8	Gore	G. Sparks	No	All	n/a
9	Gore	Wm. Hood	Yes	East ½	Inside PA
10	Gore	R. Whillans, A. Anderson, G. Whillans	Yes		Inside PA
11	Gore	Tremblay, H.R. Johnson	Yes		Inside PA
13	Gore	T. Peden	Yes	East ¼	Inside PA
14	Gore	H. Dempsey, Orange Hall, J. Savage J.P	Yes	East ¼	Inside PA
15	Gore	M. Fisher T.H.	Yes	East ¼	Outside PA
25	Con 3	Mrs. Conway	Yes	East ½	Outside PA
25	Con 3	R. Bailey	Yes	West ½	Outside PA
26	Con 3	No name	No	North ½	n/a
24	Con 2	B. Craig	Yes	N of Cyrville Rd	Outside PA
25	Con 2	J. McGuire	Yes	N of Cyrville Rd	Outside PA
26	Con 2	P. Phair	Yes	N of Cyrville Rd	Inside PA
26	Con 2	J. Ogalvie	Yes	S of Cyville Rd	Outside PA
27	Con 2	M. Sears	Yes	All	Inside PA
24	Con 1	No name	No	S of Montreal Rd	n/a
25	Con 1	D. McLaugh	Yes	E ½ South of Montreal Rd	Outside PA
25	Con 1	J. Hilton	Yes	W ½ South of Montreal Rd	Outside PA
25	Con 1	R. Gordon	Yes	E ½ North of Montreal Rd	Outside PA
25	Con 1	W.F. Kearns	Yes	Centre North Of Montreal Rd	Inside PA
25	Con 1	D.Thompson	Yes	W ½ North of Montreal Rd	Inside PA
26	Con 1	M. Speax	No	E ½ South of Montreal Rd	n/a
26	Con 1	Gunn	No	W ½ South of Montreal Rd	n/a
26	Con 1	M. Spears	Yes	E ½ North of Montreal Rd	Inside PA
26	Con 1	H. Blaisd	Yes	Centre North Of Montreal Rd	Inside PA
26	Con 1	S. Booth	Yes	W ½ North of Montreal Rd	Inside PA



Table 4: 1879 County Map Lot and Concession Information

Lot	Conc.	Name	Structure?	Portion	Notes
A	Gore	Rockcliffe	Yes	All?	Outside PA
1	Gore	No name	n/a	All	n/a
2	Gore	Mackay Estate	No	All	n/a
3	Gore	Beechwood Cemetery	No	E ½	n/a
4	Gore	No name	Yes	All	Outside PA
5	Gore	No name	No	NE corner	n/a
8	Gore	Samuel Sparks	No	E ½	n/a
9	Gore	John Sharp	No	N ½	n/a
9	Gore	Charles Sharp	Yes	N ½	Inside PA
9	Gore	B.M. Yielding	No	N ½	n/a
9	Gore	Mrs. Hood	Yes	S ½	Inside PA
9	Gore	Thomas Elmite	No	S ½	n/a
10	Gore	Alex Anderson	Yes	N ½	Inside PA
10	Gore	R. Whillans	Yes	E ½	Outside PA
11	Gore	Nicholas Tremblay	Yes	N ½	Outside PA
11	Gore	Mrs. Gibson	Yes	S ¼	Outside PA
13	Gore	B. Finley	Yes	E of Russell Road	Outside PA
13	Gore	Thomas Padden	No	W of Russell Road	n/a
14	Gore	Thomas Dempsey	Yes	W of Russell Road	Inside PA
15	Gore	John Savage	No	W of St. Laurent Blvd	n/a
15	Gore	Jason Hume	Yes	W of St. Laurent Boulevard	Outside PA
25	Con 3	J. Borthwick	Yes	SW ¼	Outside PA
25	Con 3	John Crawford	No	NW ¼	n/a
25	Con 3	L. Cyr	Yes	SE ¼	Outside PA
26	Con 3	Thomas Hill	Yes	W 1/3	Outside PA
26	Con 3	Alexander Moore	Yes	Centre 1/3	Outside PA
26	Con 3	William Howe	No	E 1/3	n/a
24	Con 2	James Craig	No	W ½	n/a
25	Con 2	John W. McGurte	Yes	All	Outside PA
26	Con 2	William Phair	Yes	W ½	Outside PA
26	Con 2	J.E. Ogilvie	Yes	NE 1/3	Outside PA
27	Con 2	Michael Cyr	No	SE ¼	n/a
24	Con 1	Warnock	No	South of Montreal Rd	n/a
25	Con 1	D. McLaughlin	Yes	S ½ North of Montreal Rd	Outside PA
25	Con 1	D. Thompson Est	Yes	W ½ South of Montreal Rd	Inside PA
25	Con 1	Welliam	Yes	E ½ South of Montreal Rd	Inside PA
26	Con 1	No names	Yes	Subdivided into many lots	Inside PA

3 STAGE I PROPERTY INSPECTION

As the Project area contained several features signalling archaeological potential, as well as several features of extensive disturbance, a Stage I property inspection was conducted to evaluate the current conditions of the Project area and determine if any areas of archaeological potential remained intact within the Project area. This review was restricted to the existing ROW.

The property inspection was conducted on November 25, 26, and 27, 2019, under cool and overcast weather conditions. The weather conditions allowed for good visibility for the inspection of the surface features. The property inspection involved the recording and photo-documentation of the field conditions.

3.1 Hillsdale Road (Map 30)

Hillsdale Road is a narrow, paved road with no sidewalks and minimal ditching in the ROW (Image 1). The road borders sparsely treed parkland to the north, and the south side of the ROW falls across manicured residential lawns. The land to the west of Hillsdale is steeply sloped (Image 2). The ROW and remainder of the Project area in this area has not been extensively disturbed and retains archaeological potential.

3.2 Acacia Avenue (Map 30)

Acacia Avenue is a small residential street with no sidewalks. Fire hydrants exist in the west side of the ROW, but no other indications of disturbance exist. This street borders a section of public parkland to the east, atop a cliff overlooking the Ottawa River basin (Image 3). This portion of the Project area has not been extensively disturbed and retains archaeological potential, with the exception of the steep slopes of the cliff area and a nearby creek.

3.3 Sandridge Road (Map 30 and 31)

Sandridge Road forms the southern border of the parkland south of the Rockcliffe Parkway as well as the RCMP complex. It is a narrow, paved road with no sidewalks, and a line of fire hydrants in the south side of the ROW. No further evidence of disturbance in the ROW or buffer zone was observed. The north side of the Sandridge Road ROW has been minimally ditched and requires Stage 2 assessment (Image 4). The south side of the Project area falls across substantial residential lawns (Image 5) which have not been extensively disturbed and retain archaeological potential.

3.4 Sir George Etienne Cartier Parkway (Map 30 and 31)

Sir George Etienne Cartier Parkway runs east-west from Rockcliffe Park to Aviation Parkway. No visible ditching or utilities have impacted the ROW beyond the road shoulder and all the adjacent ROW and Project area have not been extensively disturbed and retains archaeological potential (Images 6 and 7). It is surrounded by vast flat green lawns and forested parkland (Image 8). North of Sir George Etienne Cartier Parkway consists of open green space that slopes down to the Ottawa River (Image 9).



3.5 RCMP Complex and Musical Ride Training Facility (Map 31)

The RCMP and Musical Ride Training Facility falls within the green space south of Sir George Etienne Cartier Parkway. It is an extensive complex of government buildings, horse paddocks, and equestrian training facilities. It appears largely undisturbed, comprising flat lawn areas as well as landscaped green-spaces (Image 10).

3.6 St. Laurent Boulevard Between Hemlock Road and Sandridge Road (Map 32)

This section of St. Laurent Boulevard is a busy, wide two-lane residential street. The ROW and associated Project area in this section have been previously disturbed due to the installation of subsurface utilities and heavily manicured residential lawns (Images 11 and 12). As such, this area does not retain archaeological potential.

3.7 Hemlock Road (Map 32)

Hemlock Road crosses a wide swath of the park-lands surrounding Aviation Parkway (Images 13, 14 and 15). The majority of this area is not obviously disturbed and retains archaeological potential.

3.8 Chelsea Drive, Plum Tree Crescent, Meadow Park Place, London Terrace (Map 32)

Chelsea Drive, Plum Tree Crescent, Meadow Park Place, and London Terrace are all small residential streets bordering the Aviation Parkway park-lands to the north and east. A drainage channel runs through the parkland (Image 16). The residential lots along these streets consist of heavily manicured lawn with subsurface utilities. As this area of the Project area has been previously disturbed, it does not retain archaeological potential.

3.9 Brittany Drive (Map 32)

Brittany Drive is a two-lane residential street connecting St. Laurent Boulevard and Montreal Road. A significant portion of the south side of the ROW falls across a steeply sloped lawn that does not require further assessment (Image 19). The north side of the ROW has been disturbed through installation of fire hydrants. As this part of the Project area has been previously disturbed, it does not retain archaeological potential.

3.10 St. Laurent Boulevard From Montreal Road to Hemlock Road (Maps 32 and 33)

This section of St. Laurent Boulevard is highly developed with commercial and residential structures. Subsurface utilities and sidewalks have been installed on both side of the street (Images 20, 21, 23). As both sides of the ROW and Project area have been extensively disturbed, it does not retain archaeological potential.

Two cemeteries are also present on the west side of St. Laurent Boulevard: the Beechwood Cemetery (National Military Cemetery of the Canadian Forces) and the Notre-Dame Cemetery. The Beechwood Cemetery is located at the southwest corner of Hemlock Road and St. Laurent Boulevard. A portion of the cemetery falls within the larger Project area (Image 22). The Notre-Dame Cemetery is located at the northwest corner of St. Laurent Boulevard and Montreal Road (Image 24 and 25).



3.11 Montreal Road from St. Laurent Boulevard to Aviation Parkway (Map 33)

Montreal Road is a busy, four laned paved street. The entirety of the Montreal Road ROW and Project area has been extensively disturbed through the installation of subsurface utilities and paved surfaces and does not retain archaeological potential (Images 26, 27 and 28). A small portion of Montreal Road at Aviation Parkway has not been obviously disturbed and retains archaeological potential.

3.12 Rainsford Avenue (Map 33)

Rainsford Avenue is a quiet residential street with houses and lawns on the west side, and parkland to the east. No sidewalk exists but fire hydrants provide evidence of disturbance in the west side of the ROW. The Rainsford Avenue Project area does not retain archaeological potential.

3.13 Cummings Avenue Between Montreal Road and Ogilvie Road (Maps 33 and 34)

This section of Cummings Avenue is a two laned predominately residential street with houses, townhomes and apartment buildings. Sidewalks are present on both sides of the street, as well as above ground and subsurface utilities (Images 29 to 32). The southern end of Cummings Avenue at Ogilvie Road contains commercial and industrial buildings. The entirety of Cummings Avenue between Montreal Road and Ogilvie Road has been previously disturbed and does not retain archaeological potential.

3.14 Aviation Parkway Between Rockcliffe and Ogilvie Road (Maps 32, 33 and 34)

Aviation Parkway is a four laned major expressway running through a large green space running from Highway 417 to Rockcliffe Parkway. The expanse of park-land surrounding Aviation Parkway, beyond the road itself and its immediate ditches, remains undeveloped and retains archaeological potential (Images 33 to 37).

3.15 Skyway Street (Map 34)

Skyway Street is a small residential street between Cummings Avenue and the Aviation Parkway green-space. The entirety of Skyway Street does not retain archaeological potential due to the construction of the structures, as well as heavily manicured lawns.

3.16 Ogilvie Road (Map 34)

Ogilvie Road is the multi-lane roadway, running east from St. Laurent Boulevard. It has seen significant development, with buried utilities and fire hydrants on the north side of the ROW (Images 38, 41 and 42). Despite this, numerous sections on both sides of Ogilvie Road retain archaeological potential (Images 39 and 40). The north and south side of Ogilvie Road at Aviation Parkway retain archaeological potential.

3.17 Cummings Avenue Between Ogilvie Road and Cyrville Road (Map 34)

This section of Cummings Avenue is mostly developed with parking lots that do not retain archaeological potential (Image 44). One property on each side of the ROW, however, does retain archaeological potential (Image 43).



3.18 Cyrville Road Between Cummings Avenue and St. Laurent Boulevard (Map 34)

The entirety of Cyrville Road is highly developed (Image 45). The ROW and Project area is dominated by parking lots and their associated businesses. This area is previously disturbed and does not retain archaeological potential.

3.19 Labelle Street (Map 34)

Labelle Street is highly developed with parking areas for commercial businesses and hotels. This area is previously disturbed and does not retain archaeological potential.

3.20 Michael Street north of Highway 417 (Map 34)

North of Highway 417 Michael Street is a small two-lane street with no sidewalks and little in the way of buried utilities outside of the ROW. The majority of this area has been disturbed due to subsurface utilities and paved areas (Image 46). A small area on the west side of the ROW consists of a green space overgrown with small trees and shrubs and retains archaeological potential.

3.21 St. Laurent Boulevard from Highway 417 to Donald Street (Map 34)

This section of St. Laurent Boulevard is highly developed with commercial buildings and paved parking lots (Images 48, 49, 50 and 51). A few small grassed sections exist but these are highly landscaped and impacted by buried utilities. One larger section of flat landscaping can be found on the east side of the ROW where St. Laurent Boulevard meets Highway 417 but the presence of a substantial storm drain suggests that this landscape was created during construction of the St. Laurent cloverleaf on-ramp (Image 52). This section does not retain archaeological potential.

3.22 Coventry Road (Map 34 and 35)

Coventry Road is a wide multi-lane road dominated by large commercial enterprises and institutions. The Project area largely comprises parking lots and structures, while much of the existing green space is landscaped to a significant degree and has been impacted by fire hydrant installation and buried utilities in the ROW (Images 53 and 54). Archaeological potential exists in the buffer zone in two places: a small lawn area at the northeast corner of Coventry Road and Lola Street, as well as a series of manicured lawns on the south side of Coventry Road at Belfast Road (Image 55). These sections retain archaeological potential.

3.23 Queen Mary Street and Cross-Streets (Map 34 and 35)

Queen Mary Street is a residential two-lane street running from St. Laurent Boulevard in the east to North River Road in the west. The north side of the Queen Mary Street ROW is lined with fire hydrants (Images 56 and 57) and does not retain archaeological potential. One area along Queen Mary Street retains archaeological potential; Overbrook Park field located at the northwest corner of Queen Mary and Edith Streets. The south side of Queen Mary Street does not retain archaeological potential.

The cross-streets connecting Queen Mary and Prince Albert Street to the south are small two-lane streets with no sidewalks. For the most part the ROW encroached upon by house structures and does not retain archaeological potential.



3.24 Prince Albert Street (Map 34 and 35)

Prince Albert Street is a two-lane street with sidewalks and extended shoulders encroaching on the ROW. Fire hydrants on the north side of the ROW further limit the archaeological potential within the ROW (Images 58 and 59). House lawns in this area vary in size and placement within the larger buffer zone, and are likely heavily landscaped. Prince Albert Street does not retain archaeological potential.

3.25 North River Road (Map 35)

North River Road is a small two-lane road on the eastern margin of Riverain Park. There is no evidence of disturbance on the western half of the ROW, and no utilities were observed (Image 60). The west side of North River Road retains archaeological potential and will require Stage 2 assessment. The east side of North River Road forms terminal intersections with Queen Mary, Prince Albert, Drouin Avenue, and West Presland Road, where for the most part residential structures encroach upon the sidewalk. The east side of North River Road does not retain archaeological potential.

3.26 Vanier Parkway Between Queen Mary Street and Tremblay Road (Map 35)

Vanier Parkway is a busy four-lane road with significant landscaping on its east and west sides. North of the intersection of Vanier Parkway and Coventry Road sidewalks, storm sewers, and fire hydrants are present on both sides of the road and this section does not retain archaeological potential (Images 61 and 63).

South of Coventry Road, Vanier Parkway is heavily ditched and artificially sloped (Image 62). The southern portion of Vanier Parkway meets and crosses Highway 417 where the surrounding area is heavily landscaped and previously disturbed due to the construction of the highway. This area does not retain archaeological potential.

3.27 Highway 417 between Riverside Drive and North River Road (Map 35)

The area surrounding Highway 417 is made up of semi-wild grassland populated by shrubs and small trees. The grassed area north of Highway 417 is fenced in and some portions have not been obviously disturbed and retain archaeological potential (Image 64). A bike trail runs through the buffer zone south from Riverain Park under the bridge to Riverside Drive. The south side of Highway 417 has also been heavily landscaped during the construction of the highway and does not retain archaeological potential. Two small grassed areas south of the Highway 417 on/off ramps do not appear to be disturbed and retain archaeological potential.

3.28 Shore Street (Map 36)

Shore Street is a small two laned street that is entirely paved over with car lots (Image 66). It does not retain archaeological potential.

3.29 Triole Street (Map 36)

Triole Street is a small two laned street that is entirely paved over with car lots. It does not retain archaeological potential.



3.30 Belfast Road (Map 36)

Belfast Road is a two laned street that is almost entirely paved over with car lots (Image 67 and 68). The south side of Belfast Road ROW has been impacted by ditching/storm sewer. It does not retain archaeological potential.

3.31 Michael Street Between Belfast Road and Highway 417 (Map 36)

Michael Street is a two laned street that is occupied by a mix of paved car lots and residential style lots. Both the east and west sides of the ROW are impacted by ditching, fire hydrant installations and subsurface utilities (Images 69 to 74). Michael Street does not retain archaeological potential.

3.32 Lancaster Road (Map 37)

Lancaster Road is a two laned roadway with commercial and industrial buildings. Both the north and south sides of the Lancaster Road buffer zone contain sections that do not appear to have been significantly disturbed and retain archaeological potential (Image 77 and 78). The remainder of the north and south side of Lancaster Road has been disturbed by subsurface utilities, fire hydrants and storm sewers (Images 75, 76 and 79). These areas do not retain archaeological potential.

3.33 Gladwin Crescent (Map 37)

Gladwin Crescent is a two laned roadway that is dominated by parking lots and intensively landscaped/ditched medians (Images 81 and 82). As such it does not retain archaeological potential. The southern half, where Gladwin Crescent meets Lancaster Road, is bordered by vast lawns on the western side that retains archaeological potential (Image 80).

3.34 St. Laurent Boulevard Between Industrial Avenue and Lancaster Road (Map 37)

St. Laurent Boulevard is an extensively developed multi-lane road stretching from Hemlock Road in the north to Walkley Road in the south. This section of St. Laurent Boulevard is almost entirely developed along both sides of the road and no archaeological potential remains within the ROW (Images 83 and 84). A portion of the eastern ROW has not been extensively disturbed and retains archaeological potential.

3.35 Industrial Avenue (Map 37)

Industrial Avenue is a major four laned road that is highly developed along both sides of the ROW. The north side of the ROW has been impacted by storm sewers and on the south side by a line of fire hydrants (Images 85, 86 and 87). The green spaces present within the Project area along Industrial Avenue have been heavily landscaped or previously disturbed and do not retain archaeological potential.

3.36 Russell Road and Coronation Avenue (Map 37)

The intersection of Russell Road and Coronation Avenue comprises small manicured green spaces within the ROW that also contains above ground and below ground utilities. The entire intersection does not retain archaeological potential.

4 ANALYSIS AND CONCLUSIONS

As noted in Section 2.1, the Province of Ontario has identified numerous factors that signal the potential of a property to contain archaeological resources. The Stage I background study included a review of current land use, historic and modern maps, registered archaeological sites and previous archaeological studies, past settlement history for the area and a consideration of topographic and physiographic features, soils and drainage. According to the map-based review and background research, potential for the discovery of archaeological sites is indicated by the proximity (within 300 m) to:

1. watercourses (Rideau River and Ottawa River)
2. areas of 19th century settlement;
3. mapped 19th century thoroughfares (St. Laurent Boulevard, Hemlock Road, Montreal Road, Ogilvie Road, Cyrville Road, North River Road and Russel Road); and
4. Beechwood Cemetery and Notre Dame Cemetery.

4.1 Hillsdale Road

Hillsdale Road is a narrow, paved road with no sidewalks and minimal ditching in the ROW. The road borders sparsely treed parkland to the north, and the south side of the ROW falls across manicured residential lawns. The land to the west of Hillsdale is steeply sloped. The ROW and remainder of the Project area in this area has not been extensively disturbed and retains archaeological potential. This area will require Stage 2 survey.

4.2 Acacia Avenue

Acacia Avenue is a small residential street with no sidewalks. Fire hydrants exist in the west side of the ROW, but no other indications of disturbance exist. This street borders a section of public parkland to the east, atop a cliff overlooking the Ottawa River basin. This portion of the Project area has not been extensively disturbed and retains archaeological potential, with the exception of the steep slopes of the cliff area and a nearby creek. This area will require Stage 2 survey.

4.3 Sandridge Road

Sandridge Road forms the southern border of the parkland south of the Rockcliffe Parkway as well as the RCMP complex. It is a narrow, paved road with no sidewalks, and a line of fire hydrants in the south side of the ROW. No further evidence of disturbance in the ROW or buffer zone was observed. The north side of the Sandridge Road ROW has been minimally ditched and requires Stage 2 assessment. The south side of the Project area falls across substantial residential lawns which have not been extensively disturbed and retains archaeological potential. This area will require Stage 2 survey.

4.4 Sir George Etienne Cartier Parkway

Sir George Etienne Cartier Parkway runs east-west from Rockcliffe Park to Aviation Parkway. No visible ditching or utilities have impacted the ROW beyond the road shoulder and all the adjacent ROW and Project area have not been extensively disturbed and retains archaeological potential. It is surrounded by vast flat green lawns and forested parkland. North of Sir George Etienne Cartier Parkway consists of open green space that slopes down to the Ottawa River. This area will require Stage 2 survey.



4.5 RCMP Complex and Musical Ride Training Facility

The RCMP and Musical Ride Training Facility falls within the green space south of Sir George Etienne Cartier Parkway. It is an extensive complex of government buildings, horse paddocks, and equestrian training facilities. It appears largely undisturbed, comprising flat lawn areas as well as landscaped green-spaces. This area will require Stage 2 survey.

4.6 St. Laurent Boulevard Between Hemlock Road and Sandridge Road

This section of St. Laurent Boulevard is a busy, wide two-lane residential street. The ROW and associated Project area in this section have been previously disturbed due to the installation of subsurface utilities and heavily manicured residential lawns that were extensively disturbed during the construction based on aerial photography. As such, this area does not retain archaeological potential.

4.7 Hemlock Road

Hemlock Road crosses a wide swath of the park-lands surrounding Aviation Parkway. The majority of this area is not obviously disturbed and retains archaeological potential. This area will require Stage 2 survey.

4.8 Chelsea Drive, Plum Tree Crescent, Meadow Park Place, London Terrace

Chelsea Drive, Plum Tree Crescent, Meadow Park Place, and London Terrace are all small residential streets bordering the Aviation Parkway park-lands to the north and east. A drainage channel runs through the parkland. The residential lots along these streets consist of heavily manicured lawn with subsurface utilities that were extensively disturbed during the construction based on aerial photography. As this area of the Project area has been previously disturbed, it does not retain archaeological potential.

4.9 Brittany Drive

Brittany Drive is a two-lane residential street connecting St. Laurent Boulevard and Montreal Road. A significant portion of the south side of the ROW falls across a steeply sloped lawn that does not require further assessment. The north side of the ROW has been disturbed through installation of fire hydrants. As this part of the Project area has been previously disturbed, it does not retain archaeological potential.

4.10 St. Laurent Boulevard From Montreal Road to Hemlock Road

This section of St. Laurent Boulevard is highly developed with commercial and residential structures. Subsurface utilities and sidewalks have been installed on both side of the street. As both sides of the ROW and Project area have been extensively disturbed, it does not retain archaeological potential.

Two cemeteries are also present on the west side of St. Laurent Boulevard: the Beechwood Cemetery (National Military Cemetery of the Canadian Forces) and the Notre-Dame Cemetery. The Beechwood Cemetery is located at the southwest corner of Hemlock Road and St. Laurent Boulevard. A portion of the cemetery falls within the Project area. Numerous grave markers are present within the larger Project area. The Notre-Dame Cemetery is located at the northwest corner of St. Laurent Boulevard and Montreal Road.



4.11 Montreal Road from St. Laurent Boulevard to Aviation Parkway

Montreal Road is a busy, four laned paved street. The entirety of the Montreal Road ROW and Project area has been extensively disturbed through the installation of subsurface utilities and paved surfaces and does not retain archaeological potential. A small portion of Montreal Road at Aviation Parkway has not been obviously disturbed and retains archaeological potential. This area will require Stage 2 survey.

4.12 Rainsford Avenue

Rainsford Avenue is a quiet residential street with houses and lawns on the west side, and parkland to the east. No sidewalk exists but fire hydrants provide evidence of disturbance in the west side of the ROW. The Rainsford Avenue Project area does not retain archaeological potential.

4.13 Cummings Avenue Between Montreal Road and Ogilvie Road

This section of Cummings Avenue is a two laned predominately residential street with houses, townhomes and apartment buildings. Sidewalks are present on both sides of the street, as well as above ground and subsurface utilities. The southern end of Cummings Avenue at Ogilvie Road contains commercial and industrial buildings. The entirety of Cummings Avenue between Montreal Road and Ogilvie Road has been previously disturbed and does not retain archaeological potential.

4.14 Aviation Parkway Between Rockcliffe and Ogilvie Road

Aviation Parkway is a four laned major expressway running through a large green space running from Highway 417 to Rockcliffe Parkway. The expanse of park-land surrounding Aviation Parkway, beyond the road itself and its immediate ditches, remains undeveloped and retains archaeological potential. Stage 2 assessment of this area is required.

4.15 Skyway Street

Skyway Street is a small residential street between Cummings Avenue and the Aviation Parkway green-space. The entirety of Skyway Street does not retain archaeological potential due to the construction of the structures, as well as heavily manicured lawns that were extensively disturbed during the construction based on aerial photography.

4.16 Ogilvie Road

Ogilvie Road is the multi-lane roadway, running east from St. Laurent Boulevard. It has seen significant development, with buried utilities and fire hydrants on the north side of the ROW. Despite this, numerous sections on both sides of Ogilvie Road retain archaeological potential. The north and south side of Ogilvie Road at Aviation Parkway retain archaeological potential and will require Stage 2 assessment.

4.17 Cummings Avenue Between Ogilvie Road and Cyrville Road

This section of Cummings Avenue is mostly developed with parking lots that do not retain archaeological potential. One property on each side of the ROW, however, does retain archaeological potential. These are both treed green spaces and will require Stage 2 assessment.



4.18 Cyrville Road Between Cummings Avenue and St. Laurent Boulevard

The entirety of Cyrville Road is highly developed. The ROW and Project area is dominated by parking lots and their associated businesses. This area is previously disturbed and does not retain archaeological potential.

4.19 Labelle Street

Labelle Street is highly developed with parking areas for commercial businesses and hotels. This area is previously disturbed and does not retain archaeological potential.

4.20 Michael Street north of Highway 417

North of Highway 417 Michael Street is a small two-lane street with no sidewalks and little in the way of buried utilities outside of the ROW. The majority of this area has been disturbed due to subsurface utilities and paved areas. A small area on the west side of the ROW consists of a green space overgrown with small trees and shrubs and retains archaeological potential. Stage 2 assessment is required for this area.

4.21 St. Laurent Boulevard from Highway 417 to Donald Street

This section of St. Laurent Boulevard is highly developed with commercial buildings and paved parking lots. A few small grassed sections exist but these are highly landscaped and impacted by buried utilities. One larger section of flat landscaping can be found on the east side of the ROW where St. Laurent Boulevard meets Highway 417 but the presence of a substantial storm drain suggests that this landscape was created during construction of the St. Laurent cloverleaf on-ramp. This section does not retain archaeological potential.

4.22 Coventry Road

Coventry Road is a wide multi-lane road dominated by large commercial enterprises and institutions that was covered by a previous archaeological assessment by Golder in 2013. The Project area largely comprises parking lots and structures, while much of the existing green space is landscaped to a significant degree and has been impacted by fire hydrant installation and buried utilities in the ROW. Archaeological potential exists in the buffer zone in two places: a small lawn area at the northeast corner of Coventry Road and Lola Street, as well as a series of manicured lawns on the south side of Coventry Road at Belfast Road. These sections retain archaeological potential and are recommended for Stage 2 assessment.

4.23 Queen Mary Street and Cross-Streets

Queen Mary Street is a residential two-lane street running from St. Laurent Boulevard in the east to North River Road in the west. The western portion of Queen Mary Street was previously subject to an archaeological assessment by Heritage Quest in 2008. The north side of the Queen Mary Street ROW is lined with fire hydrants and does not retain archaeological potential. One area along Queen Mary Street retains archaeological potential and will require Stage 2 assessment; Overbrook Park field located at the northwest corner of Queen Mary and Edith Streets. The south side of Queen Mary Street does not retain archaeological potential.

The cross-streets connecting Queen Mary and Prince Albert Street to the south are small two-lane streets with no sidewalks. For the most part the ROW encroached upon by house structures that were extensively disturbed during the construction based on aerial photography and does not retain archaeological potential.



4.24 Prince Albert Street

Prince Albert Street is a two-lane street with sidewalks and extended shoulders encroaching on the ROW. Fire hydrants on the north side of the ROW further limit the archaeological potential within the ROW. House lawns in this area vary in size and placement within the larger buffer zone, are heavily landscaped and were extensively disturbed during the construction based on aerial photography. Prince Albert Street does not retain archaeological potential.

4.25 North River Road

North River Road is a small two-lane road on the eastern margin of Riverain Park. That was partially covered by a previous archaeological assessment by Heritage Quest. There is no evidence of disturbance on the western half of the ROW, and no utilities were observed. The west side of North River Road retains archaeological potential and will require Stage 2 assessment. The east side of North River Road forms terminal intersections with Queen Mary, Prince Albert, Drouin Avenue, and West Presland Road, where residential structures encroach upon the sidewalk and were extensively disturbed during the construction based on aerial photography. The east side of North River Road does not retain archaeological potential.

4.26 Vanier Parkway Between Queen Mary Street and Tremblay Road

Vanier Parkway is a busy four-lane road with significant landscaping on its east and west sides. North of the intersection of Vanier Parkway and Coventry Road sidewalks, storm sewers, and fire hydrants are present on both sides of the road and this section does not retain archaeological potential.

South of Coventry Road, Vanier Parkway is heavily ditched and artificially sloped. The southern portion of Vanier Parkway meets and crosses Highway 417 where the surrounding area is heavily landscaped and previously disturbed due to the construction of the highway. This area does not retain archaeological potential.

4.27 Highway 417 between Riverside Drive and North River Road

The area surrounding Highway 417 is made up of semi-wild grassland populated by shrubs and small trees. The grassed area north of Highway 417 is fenced in and some portions have not been obviously disturbed and retain archaeological potential. A bike trail runs through the buffer zone south from Riverain Park under the bridge to Riverside Drive. The south side of Highway 417 has also been heavily landscaped during the construction of the highway and does not retain archaeological potential. Two small grassed areas south of the Highway 417 on/off ramps do not appear to be disturbed and retain archaeological potential; however, one was previously subject to a Stage 2 archaeological assessment by Golder. The other will require Stage 2 assessment.

4.28 Shore Street

Shore Street is a small two laned street that is entirely paved over with car lots that were extensively disturbed during the construction based on aerial photography. It does not retain archaeological potential.

4.29 Triole Street

Triole Street is a small two laned street that is entirely paved over with car lots that were extensively disturbed during the construction based on aerial photography. It does not retain archaeological potential.



4.30 Belfast Road

Belfast Road is a two laned street that is almost entirely paved over with car lots that were extensively disturbed during the construction based on aerial photography. The south side of Belfast Road ROW has been impacted by ditching/storm sewer. It does not retain archaeological potential.

4.31 Michael Street Between Belfast Road and Highway 417

Michael Street is a two laned street that is occupied by a mix of paved car lots and residential style lots that were extensively disturbed during the construction based on aerial photography. Both the east and west sides of the ROW are impacted by ditching, fire hydrant installations and subsurface utilities. It does not retain archaeological potential.

4.32 Lancaster Road

Lancaster Road is a two laned roadway with commercial and industrial buildings that were extensively disturbed during the construction based on aerial photography. Both the north and south sides of the Lancaster Road buffer zone contain sections that do not appear to have been significantly disturbed and retain archaeological potential. These areas will require Stage 2 assessment. The remainder of the north and south side of Lancaster Road has been disturbed by subsurface utilities, fire hydrants and storm sewers. These areas do not retain archaeological potential.

4.33 Gladwin Crescent

Gladwin Crescent is a two laned roadway that is dominated by parking lots and intensively landscaped/ditched medians. As such it retains no archaeological potential. The southern half, where Gladwin Crescent meets Lancaster Road, is bordered by vast lawns on the western side that retains archaeological potential and will require Stage 2 assessment.

4.34 St. Laurent Boulevard Between Industrial Avenue and Lancaster Road

St. Laurent Boulevard is an extensively developed multi-lane road stretching from Hemlock Road in the north to Walkley Road in the south. This section of St. Laurent Boulevard is almost entirely developed along both sides of the road and no archaeological potential remains within the ROW. A portion of the eastern ROW has not been extensively disturbed and retains archaeological potential. This area will require Stage 2 assessment.

4.35 Industrial Avenue

Industrial Avenue is a major four laned road that is highly developed along both sides of the ROW. The north side of the ROW has been impacted by storm sewers and on the south side by a line of fire hydrants. The green spaces present within the Project area along Industrial Avenue have been heavily landscaped or previously disturbed based on aerial photography and do not retain archaeological potential.

4.36 Russell Road and Coronation Avenue

The intersection of Russell Road and Coronation Avenue comprises small manicured green spaces within the ROW that also contains above ground and below ground utilities. The entire intersection does not retain archaeological potential.



A review of historical and modern aerial photography indicates that the Project area has been extensively disturbed and does not retain archaeological potential.

4.37 Overall Project Area

The Stage I property inspection has visually confirmed that most of the Project area is considered extensively disturbed (58.4%; 235.51 ha), sloped (3.7%; 15.09 ha), wet (3.6%; 14.43 ha) or previously assessed (1.4%; 5.71 ha) and no longer contains the potential for recovering archaeological resources. A large area (32.5%; 131.06 ha) within the Project area retains archaeological potential and these areas of archaeological potential should be subject to Stage 2 archaeological assessment. In keeping with provincial standards, the portions of the Project area that consist of unploughable land are recommended for test pit assessment. A 5 m transect interval is recommended to achieve the provincial standard. In addition, a small area (0.1%; 0.07 ha) was recommended for construction monitoring and a cemetery boundary investigation (0.4%; 1.5 ha).

As the available proponent mapping is at a large scale and is for planning purposes only at this point (Map 38) we have not attempted to present the Stage I recommendations on the proponent mapping.



5 RECOMMENDATIONS

Based on the information compiled in the background study and the property inspection, the following recommendation is made:

5.1 Preliminary Preferred Route 1 (Phase 4)

The majority of preliminary preferred route is free of archaeological concern; however, there are numerous large areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- The RCMP and Musical Ride Training Facility that consists of open green spaces;
- Hemlock Road – open green spaces and forested areas on both sides of Hemlock Road;
- Aviation Parkway – open green spaces and forested areas on both sides of Aviation Parkway;
- Ogilvie Road – the green spaces on the north and south side of Ogilvie Road at Aviation Parkway;
- Cummings Avenue between Ogilvie Road and Cyrville Road – two treed green spaces on the east and west side of Cummings Avenue; and
- Michael Street north of Highway 417 – a small area on the west side of the ROW consists of a green space overgrown with small trees and shrubs.

5.2 Route 2

Route 2 along Cummings Road should be considered free of archaeological concern and no further assessment is recommended.

5.3 Route 3

The majority of Route 3 along Montreal Road and St. Laurent Boulevard to Rockcliffe Control Station is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Montreal Road at Aviation Parkway – open green spaces and forested areas on the north and south side of Montreal Road; and
- Sandridge Road – the north and south side of Sandridge Road has been minimally disturbed.

5.4 Notre Dame Cemetery

The Notre Dame Cemetery boundaries are fenced and a row of monuments stands immediately west of this fence adjacent to the ROW. As this cemetery is in the area associated with a 19th-century church, there is potential to be unmarked burials in the area. As such, a cemetery boundary investigation may be required for the ROW in this area; however, the specifics of this strategy should be developed after the completion of the Stage 2 survey of the area in consultation with the MTHCI, BAO, and cemetery operator if there is potential for the boundary area to be impacted.



5.5 Beechwood Cemetery

The Beechwood Cemetery boundaries are fenced and there are no markers close to the ROW. No known church is associated with the cemetery. As this cemetery was founded in 1873, there is potential to be unmarked burials in the area. As such, a cemetery boundary investigation may be required for the ROW in this area; however, the specifics of this strategy should be developed after the completion of the Stage 2 survey of the area in consultation with the MTHCI, BAO, and cemetery operator if there is potential for the boundary area to be impacted.

5.6 Route 4

Route 4 along Brittany Drive should be considered free of archaeological concern and no further assessment is recommended.

5.7 Route 5

The majority of Route 5 along Coventry Road is free of archaeological concern; however, there are several areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Coventry Road – a small lawn area at the northeast corner of Coventry Road and Lola Street, as well as a manicured lawn on the south side of Coventry Road at Belfast Road; and
- Highway 417 – two small grassed sections north of the highway and one small grassed section west of Riverside Drive.

5.8 Route 6

The majority of Route 6 along Queen Mary Street and North River Road is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- North River Road – western side of the road; and
- Queen Mary Street and North River Road Intersection – construction monitoring was recommended (Heritage Quest 2006)

5.9 Route 7

Route 7 along Prince Albert Street should be considered free of archaeological concern and no further assessment is recommended.

5.10 Route 8

Route 8 along Cyrville Road between Cummings Avenue and St. Laurent Boulevard should be considered free of archaeological concern and no further assessment is recommended.

5.11 Route 9

Route 9 along Vanier Parkway, Presland Road and Drouin Avenue should be considered free of archaeological concern and no further assessment is recommended.



5.12 Phase 3 – Northern Portion

The northern portion of the Phase 3 pipeline overlaps with Route 3 and only diverges on Hillsdale Road. The open grassed and treed areas along Hillsdale Road retain archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Hillsdale Road – any open grassed or treed area along Hillsdale Road

5.13 Phase 3 – Central Portion

The central portion of the Phase 3 pipeline overlaps with Route 1 and 5 and only diverges along St. Laurent Boulevard between Donald Street and Highway 417. This portion should be considered free of archaeological concern and no further assessment is recommended.

5.14 Phase 3 – Southern Portion

The majority of the southern portion of Phase 3 along Lancaster Road, Gladwin Crescent, Bourassa Street, St. Laurent Boulevard and Industrial Avenue is free of archaeological concern; however, there are areas that still have archaeological potential and require Stage 2 survey. As these lands are non-ploughable, the Stage 2 survey should consist of a standard test pit survey at a 5 m transect interval. The areas that require Stage 2 survey include:

- Lancaster Road – open grassed or treed area along the north and south side;
- Northwest corner of Lancaster Road and Gladwin Crescent – open grassed area; and
- South side of Bourassa Street – open grassed area.

5.15 Previously Assessed- Further Work Needed

Several previous archaeological assessments occurred within the current Project area, with two having outstanding recommendations. The first outstanding recommendations are for the intersection of Queen Mary Street and North River Road where construction monitoring was recommended (Heritage Quest 2006; Maps 8 and 35). The second is for the green space along the Rideau River, where it was recommended for Stage 2 assessment (Golder 2013; Maps 10 and 35).

5.16 Previously Assessed- No Further Work Needed

Several previous archaeological assessments occurred within the current Project area which meet current MHSTCI Standards and Guidelines (McGovern Heritage 2004; Heritage Quest 2006; ASI 2007; Golder 2013; Stantec 2018; TMHC 2018, 2019). As such, these areas should be considered as previously assessed at this time. If any of these areas are to be impacted, they should not be subject to Stage 2 archaeological assessment.

If the Project area is changed to incorporate lands not covered within this assessment, then additional archaeological assessment may be required.

These recommendations are subject to the conditions laid out in Section 7.0 of this report and to the Ministry of Heritage, Sport, Tourism and Culture Industries' review and acceptance of this report into the provincial registry.



6 SUMMARY

A Stage I background study was undertaken for a proposed pipeline corridor in Ottawa, Ontario. The background research indicated that the Project area was in proximity to features signalling archaeological potential, namely: 1) watercourses (Rideau River and Ottawa River); 2) areas of 19th century settlement; 3) mapped 19th century thoroughfares (St. Laurent Boulevard, Hemlock Road, Montreal Road, Ogilvie Road, Cyrville Road, North River Road and Russel Road); and 4) Beechwood Cemetery and Notre Dame Cemetery. Therefore, based on the background review, some portions of the Project area have potential for either First Peoples or 18th or 19th century sites. As the Project area contained several features signalling archaeological potential, as well as several features of extensive disturbance, a Stage I property inspection was conducted to evaluate the current conditions of the Project area and determine if any areas of archaeological potential remained intact within the Project area. The Stage I property inspection has visually confirmed that most of the Project area is considered extensively disturbed (58.3%; 235.36 ha), sloped (3.7%; 15.09 ha), wet (3.6%; 14.43 ha) or previously assessed (1.4%; 5.71 ha) and no longer contains the potential for recovering archaeological resources. A large area (32.5%; 131.28 ha) within the Project area retains archaeological potential and these areas of archaeological potential should be subject to Stage 2 archaeological assessment. In keeping with provincial standards, the portions of the Project area that consist of unploughable land are recommended for test pit assessment. A 5 m transect interval is recommended to achieve the provincial standard. In addition, pending the results of the Stage 2 test pit survey a cemetery boundary investigation may be required for the Notre Dame Cemetery at the intersection of St. Laurent Boulevard and Montreal Road and for Beechwood Cemetery at the intersection of Hamlock Road and St. Laurent Boulevard.



7 ADVICE ON COMPLIANCE WITH LEGISLATION

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

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

Should previously undocumented (i.e., unknown or deeply buried) archaeological resources be discovered, there may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the Ontario Heritage Act. Further, archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Burial Sites, War Graves, Abandoned Cemeteries and Cemetery Closures, Ontario Ministry of Government and Consumer Services. Effective as of January 16, 2016, Nancy Watkins, Senior Policy Analyst, is the new Registrar. Her telephone number is 416 212-7499 and her e-mail address is Nancy.Watkins@ontario.ca.



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9 IMAGES

Image 1: Open Green Space and Paved Pathway (looking northwest)



Image 3: Steeply Sloped Area (looking southeast)



Image 5: Sandridge Rd at Birch Ave, South Side ROW (looking west)



Image 2: Path and Steeply Sloped Land (looking northwest)



Image 4: Sandridge Rd at Birch Ave, North Side ROW (looking east)



Image 6: Sir George Etienne Cartier Parkway, South Side ROW (looking east)



Image 7: Sir George Etienne Cartier Parkway, North Side ROW (looking west)



Image 9: Steeply Sloped Area North of Ottawa River (looking northwest)



Image 11: St. Laurent Blvd at Sandridge Rd, West Side ROW (looking northeast)



Image 8: Paved Path and Open Green Space (looking southeast)



Image 10: Norman Gleadow at Maxwell Bailey (looking west)



Image 12: St. Laurent Blvd at Sandridge Hemlock Rd, East Side ROW (looking north)

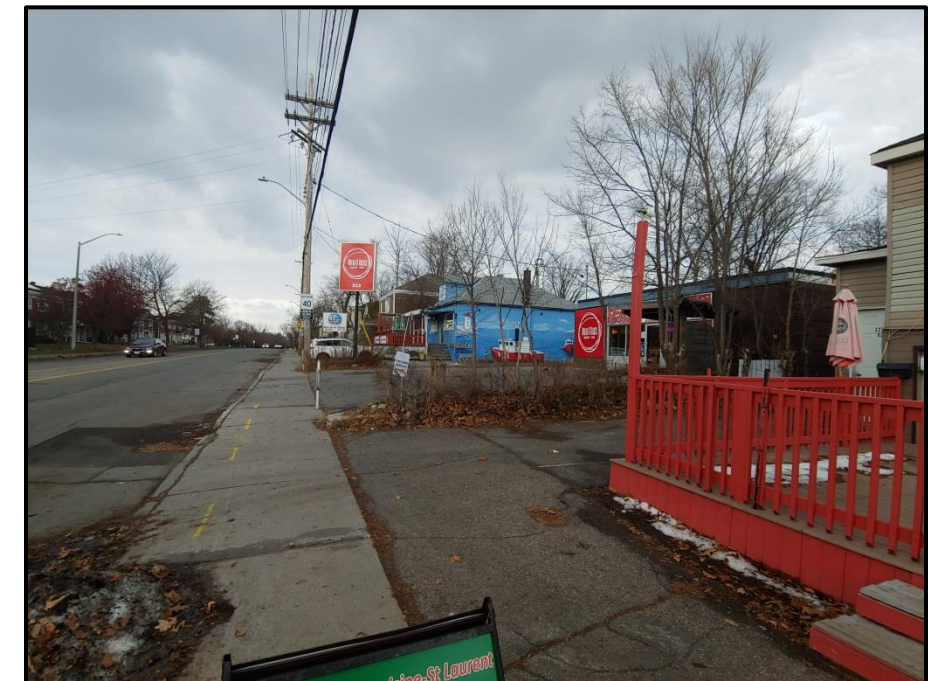


Image I3: Hemlock Rd at St. Laurent Blvd, East Side ROW (looking north)



Image I5: Hemlock Rd, West Side ROW (looking north)



Image I7: Hemlock Rd at Aviation Pathway, West Side ROW (looking south)



Image I4: Park at Hemlock Road (looking east)



Image I6: Open Parkland East of Blasdell Ave (looking northwest)



Image I8: Brittany Dr at St. Laurent Blvd, South Side ROW (looking east)



Image 19: Steeply Sloped Area on Brittany Dr, South Side ROW (looking west)



Image 21: St. Laurent Blvd at Montreal Rd, East Side ROW (looking north)



Image 23: St. Laurent Blvd at Brittany St, West Side ROW (looking north)



Image 20: St. Laurent Blvd at Hemlock Road, North Side ROW (looking southeast)



Image 22: Beechwood Cemetery (looking southeast)



Image 24: Notre Dame Cemetery (looking north)

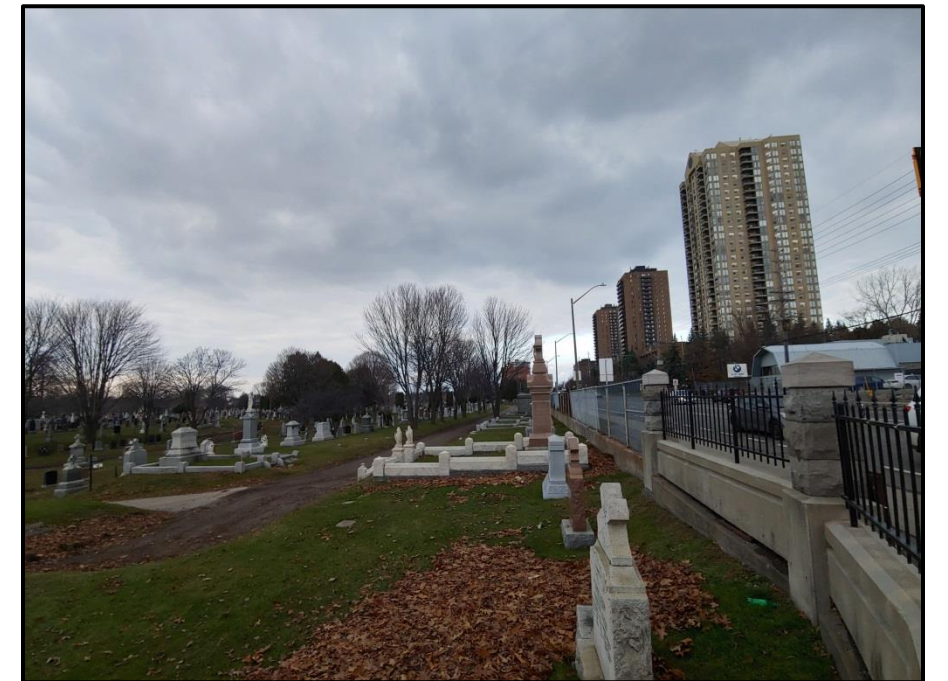


Image 25: Notre Dame Cemetery (looking north)

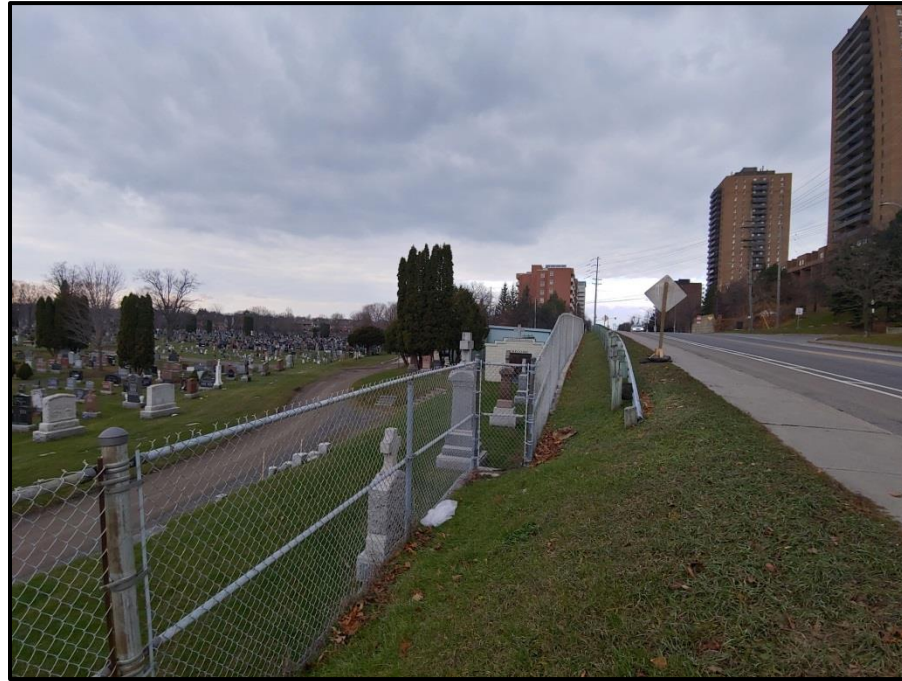


Image 27: Montreal Rd at Brittany Dr, South Side ROW (looking southwest)



Image 29: Cummings Ave at Montreal Rd, South Side ROW (looking southeast)



Image 26: Montreal Rd at St. Laurent Blvd, North Side ROW (looking northeast)



Image 28: Montreal Rd at Brittany Dr, North Side ROW (looking northeast)



Image 30: Cummings Ave at Gardenvale Rd, East Side ROW (looking north)



Image 31: Cummings Ave at Gardenvale Rd, West Side ROW (looking south)



Image 33: Aviation Parkway at Montreal Rd, West Side ROW (looking north)



Image 35: Aviation Parkway, East Side ROW (looking south)



Image 32: Cummings Ave at Donald St, West Side ROW (looking south)



Image 34: Aviation Parkway at Montreal Rd, West Side ROW (looking south)



Image 36: Aviation Parkway, West Side ROW (looking north)



Image 37: Aviation Parkway Median (looking southeast)



Image 39: Ogilvie Rd at Aviation Parkway, South Side ROW (looking east)



Image 41: Ogilvie Rd at Cyrville Rd, North Side ROW (looking east)



Image 38: Ogilvie Rd at Casboro Rd, North Side ROW (looking west)



Image 40: Ogilvie Rd at Aviation Parkway, North Side ROW (looking west)

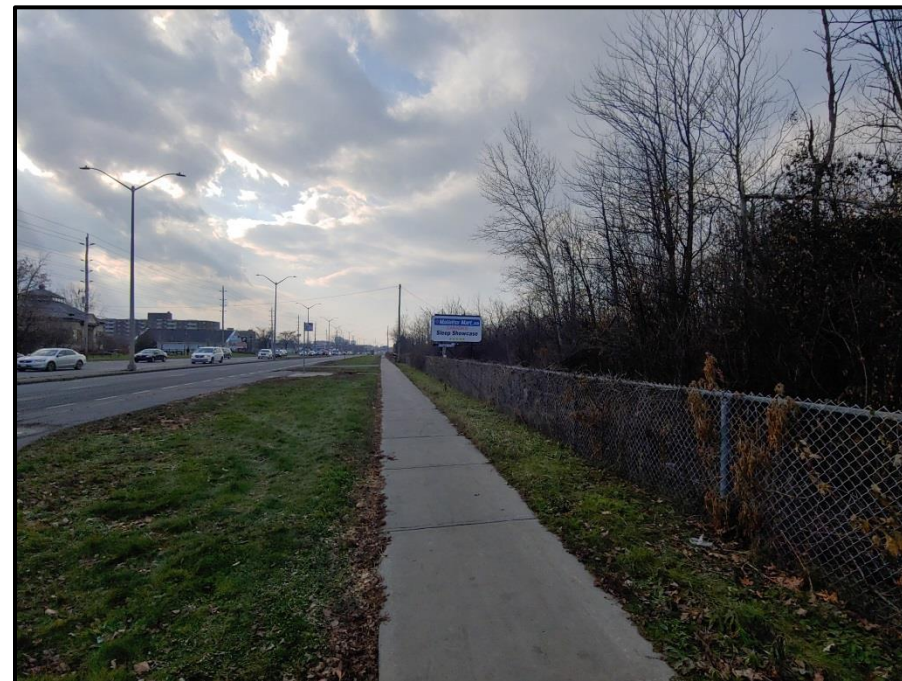


Image 42: Ogilvie Rd at Cyrville Rd, South Side ROW (looking east)



Image 43: Ogilvie Rd at Cummings Ave, West Side ROW (looking south)



Image 45: Cyrville Rd at Ogilvie Rd, North Side ROW (looking southeast)



Image 47: Michael St at Labelle St, East Side ROW (looking north)



Image 44: Cummings Ave at Cyrville Rd, East Side ROW (looking north)



Image 46: Michael St at Highway 417, West Side ROW (looking north)



Image 48: St. Laurent Blvd at Donald St, West Side ROW (looking south)



**Image 49: St. Laurent Blvd at Cyrville Rd, East Side ROW
(looking north)**



**Image 51: St. Laurent Blvd at Lemieux St, East Side ROW
(looking north)**



**Image 53: St. Laurent Blvd at Coventry Rd, North Side ROW
(looking west)**



**Image 50: St. Laurent Blvd at Coventry Rd, West Side ROW
(looking south)**



**Image 52: St. Laurent Blvd at Lemieux St, East Side ROW
(looking south)**



Image 54: Coventry Road, North Side ROW (looking west)



Image 55: Coventry Rd at Belfast Rd, South Side ROW (looking east)



Image 57: Queen Mary St at Frances Street, North Side ROW (looking west)



Image 59: Prince Albert St at Quill St, North Side ROW (looking east)



Image 56: Queen Mary St at St. Laurent Blvd, North Side ROW (looking west)



Image 58: Prince Albert St at Alesther St, South Side ROW (looking west)



Image 60: North River Rd at Queen Mary St, West Side ROW (looking south)



Image 61: Vanier Parkway, West Side ROW (looking southeast)



Image 63: Vanier Parkway, East Side ROW (looking northwest)



Image 65: South of Highway 417 ROW (looking east)



Image 62: Vanier Parkway, West Side ROW (looking northwest)



Image 64: North of Highway 417 ROW (looking east)



Image 66: Shore St at Triolet St, South Side ROW (looking northwest)



Image 67: Belfast St at Michael St, North Side ROW (looking west)



Image 69: Michael St at Belfast Rd, East Side ROW (looking north)



Image 71: Michael St at Train Tracks, East Side ROW (looking north)



Image 68: Belfast St at Triolet St, South Side ROW (looking east)



Image 70: Michael St at Train Tracks, West Side ROW (looking south)



Image 72: Michael St at Parisien St, East Side ROW (looking south)



Image 73: Michael St at Parisien St, West Side ROW (looking south)



Image 75: Lancaster Rd, West Side ROW (looking west)



Image 77: Lancaster Rd, West Side ROW (looking east)



Image 74: Michael St at Parisien St, West Side ROW (looking north)



Image 76: Lancaster Rd, East Side ROW (looking east)



Image 78: Lancaster Rd, North Side ROW (looking east)



**Image 79: Lancaster Rd at Gladwin Cres, North Side ROW
(looking east)**



**Image 81: Gladwin Cres at Lancaster Rd, East Side ROW
(looking north)**



**Image 83: St. Laurent Blvd at Innes Road, East Side ROW
(looking south)**



**Image 80: Gladwin Cres at Lancaster Rd, West Side ROW
(looking north)**



Image 82: Gladwin Cres North Side ROW (looking southwest)



**Image 84: St. Laurent Blvd at Innes Road, West Side ROW
(looking south)**



Image 85: Industrial Ave, North Side ROW (looking west)



Image 87: Industrial Ave at Russell Rd, North Side ROW (looking southeast)



Image 86: Industrial Ave, South Side ROW (looking east)

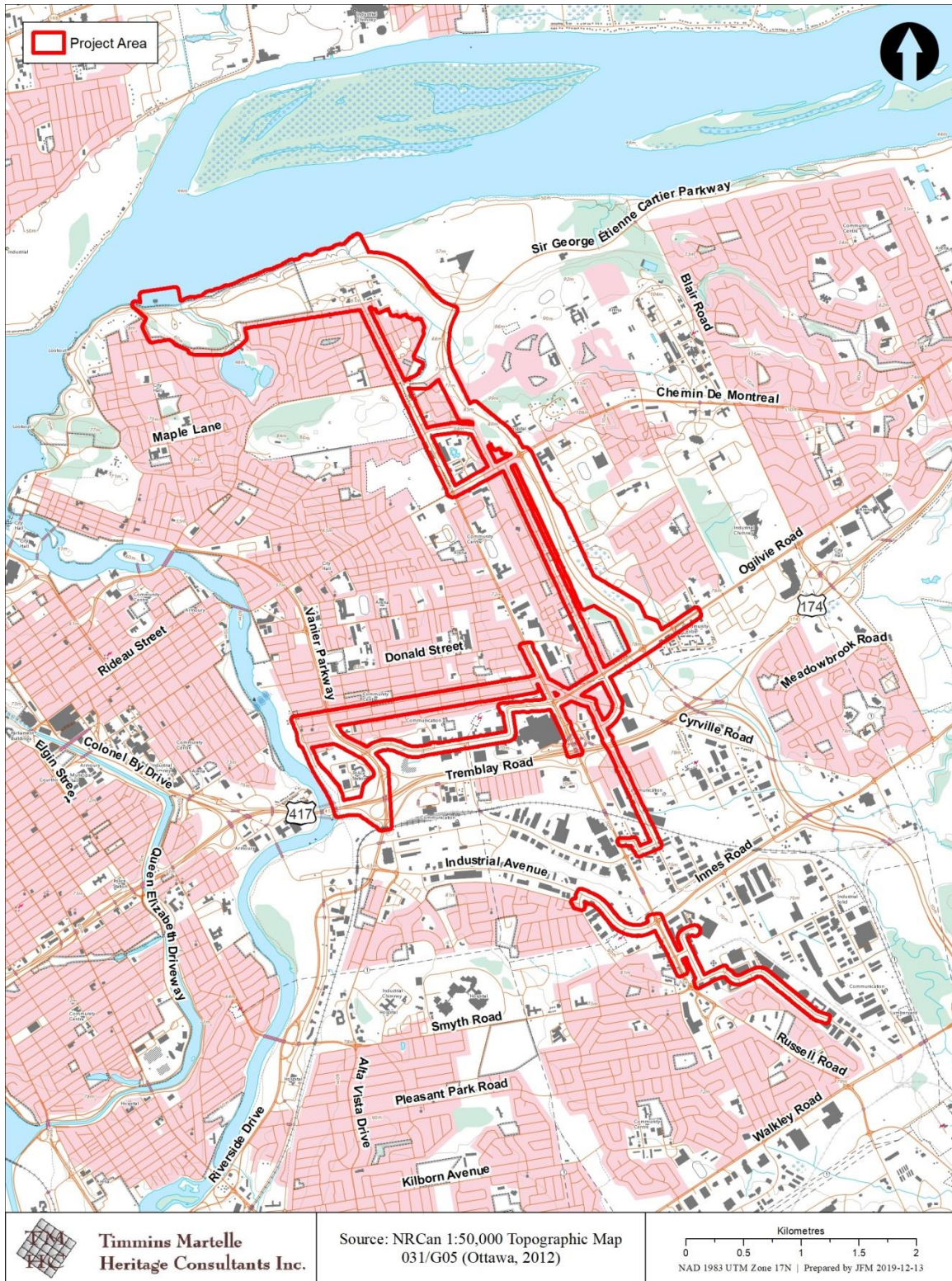


Image 88: Russell Rd, East Side ROW (looking north)

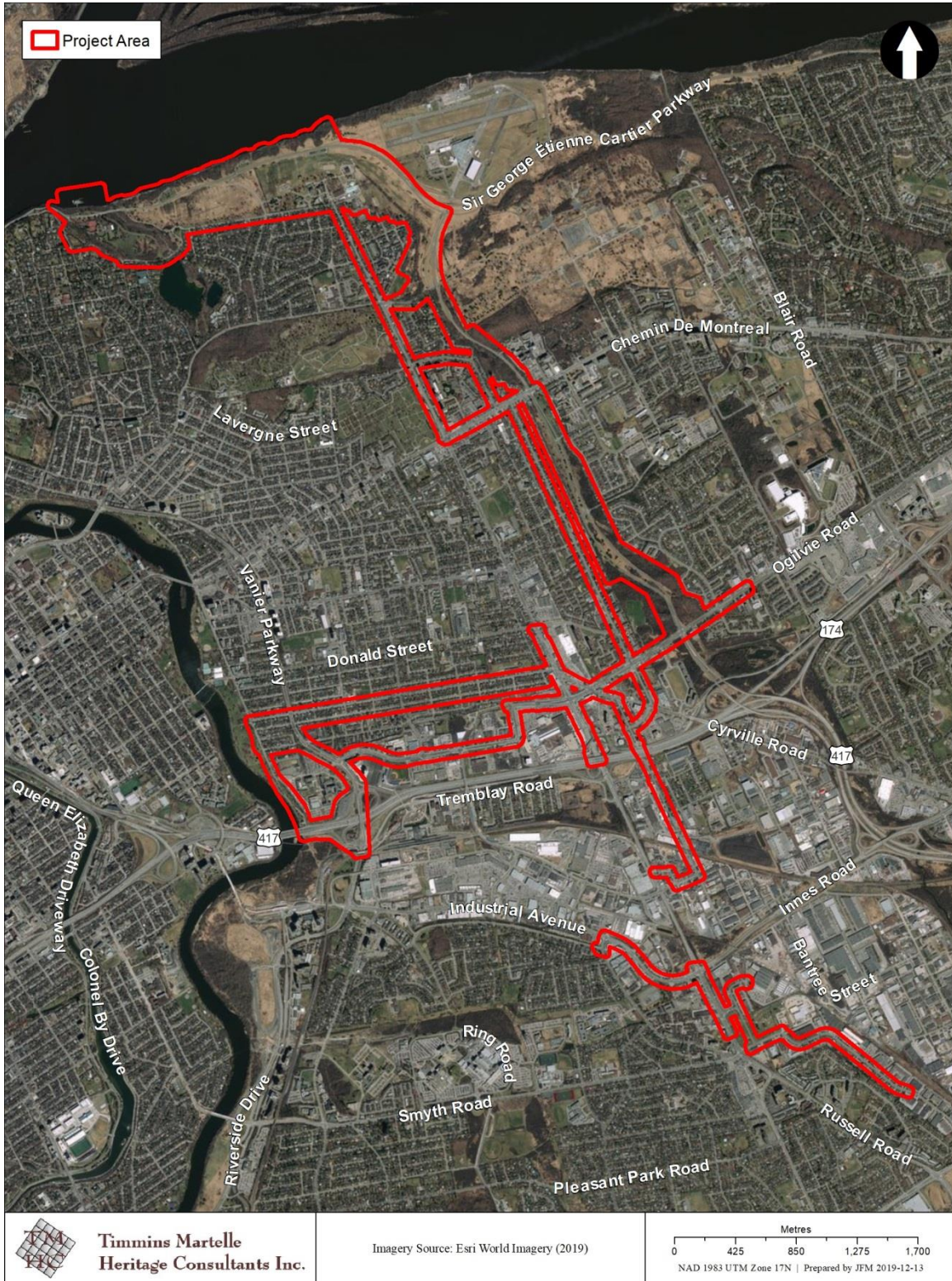




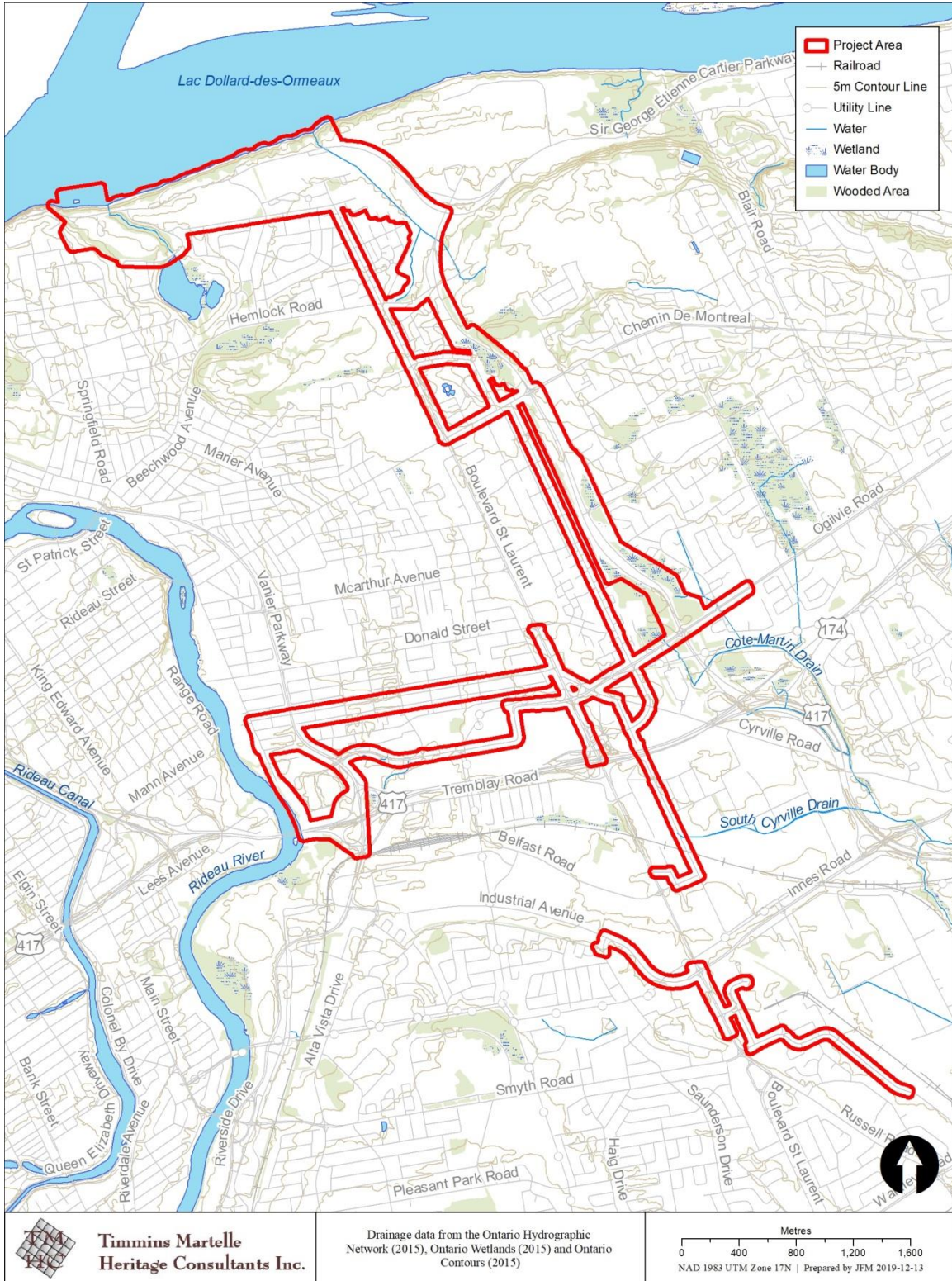
10 MAPS



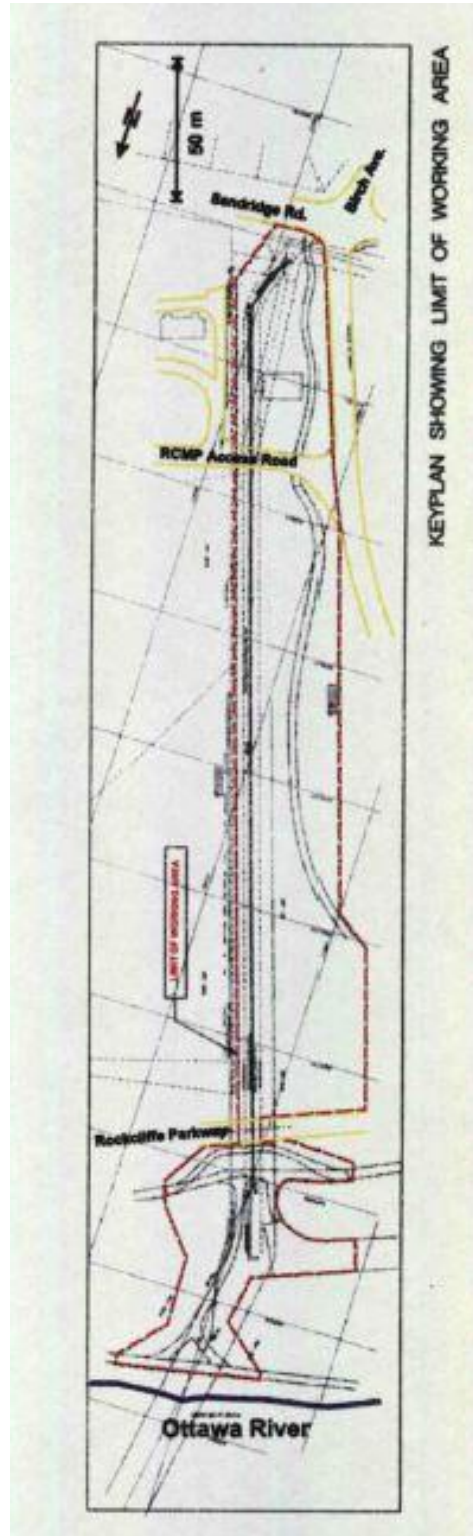
Map 1: Location of the Project Area in the City of Ottawa, ON



Map 2: Location of the Project Area in the City of Ottawa, ON



Map 4: Drainage Within the Vicinity of the Project Area



Map 5: McGovern Heritage 2004 Stage 2 Project Area

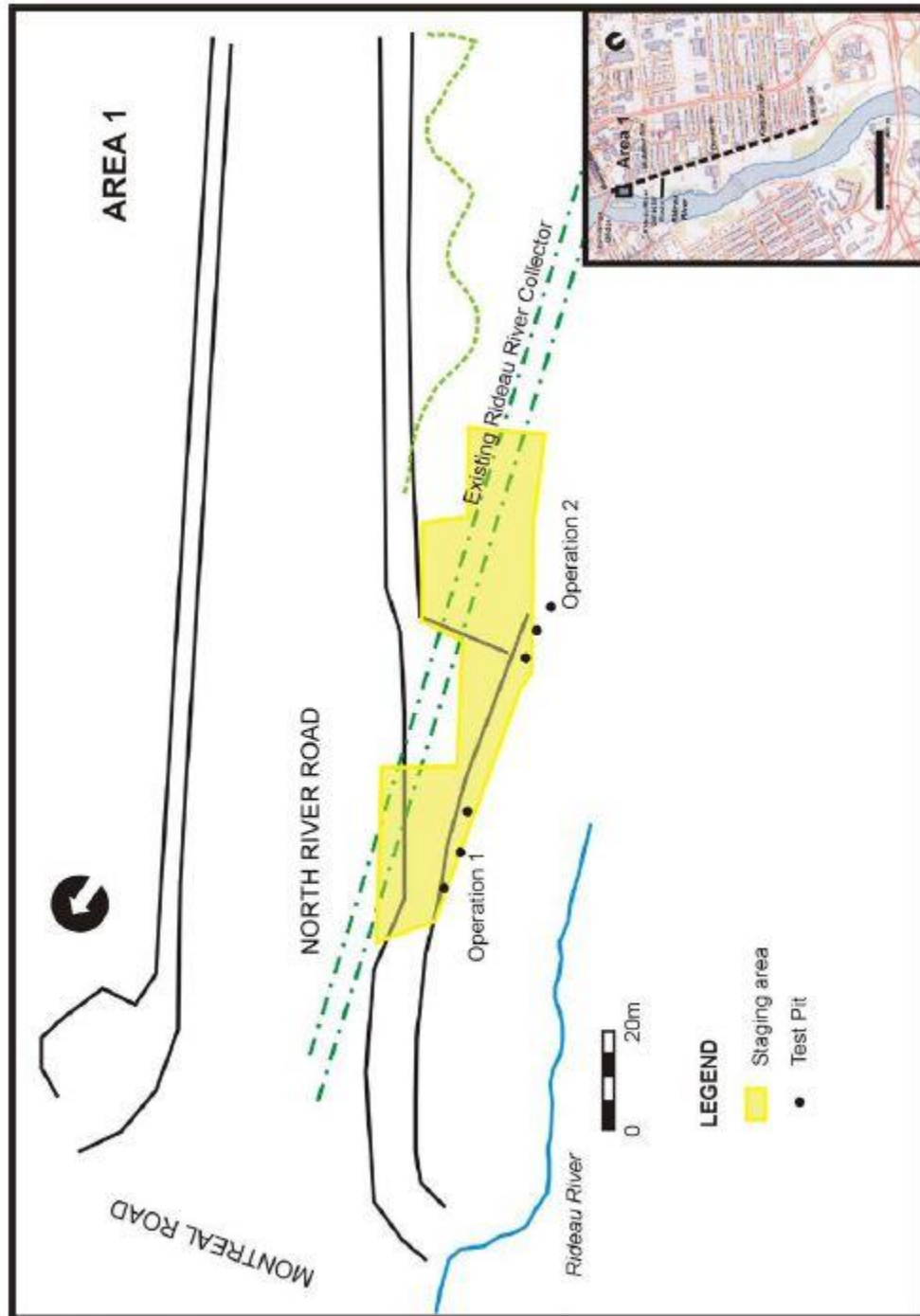


Figure 2. Area 1.

Map 6: Heritage Quest 2006 Stage 2 Assessment Area I

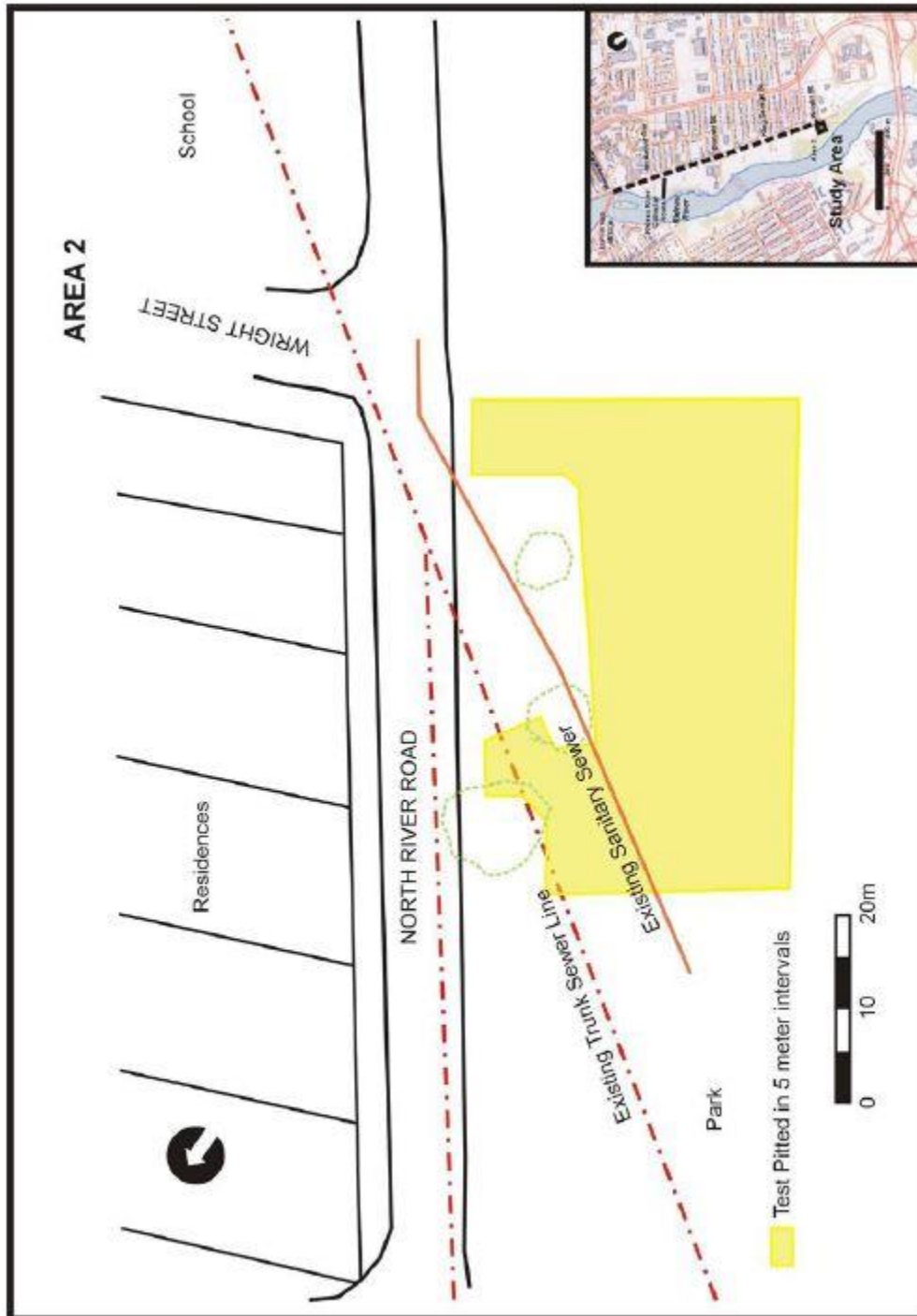


Figure 3. Area 2.

Map 7: Heritage Quest 2006 Stage 2 Assessment Area 2

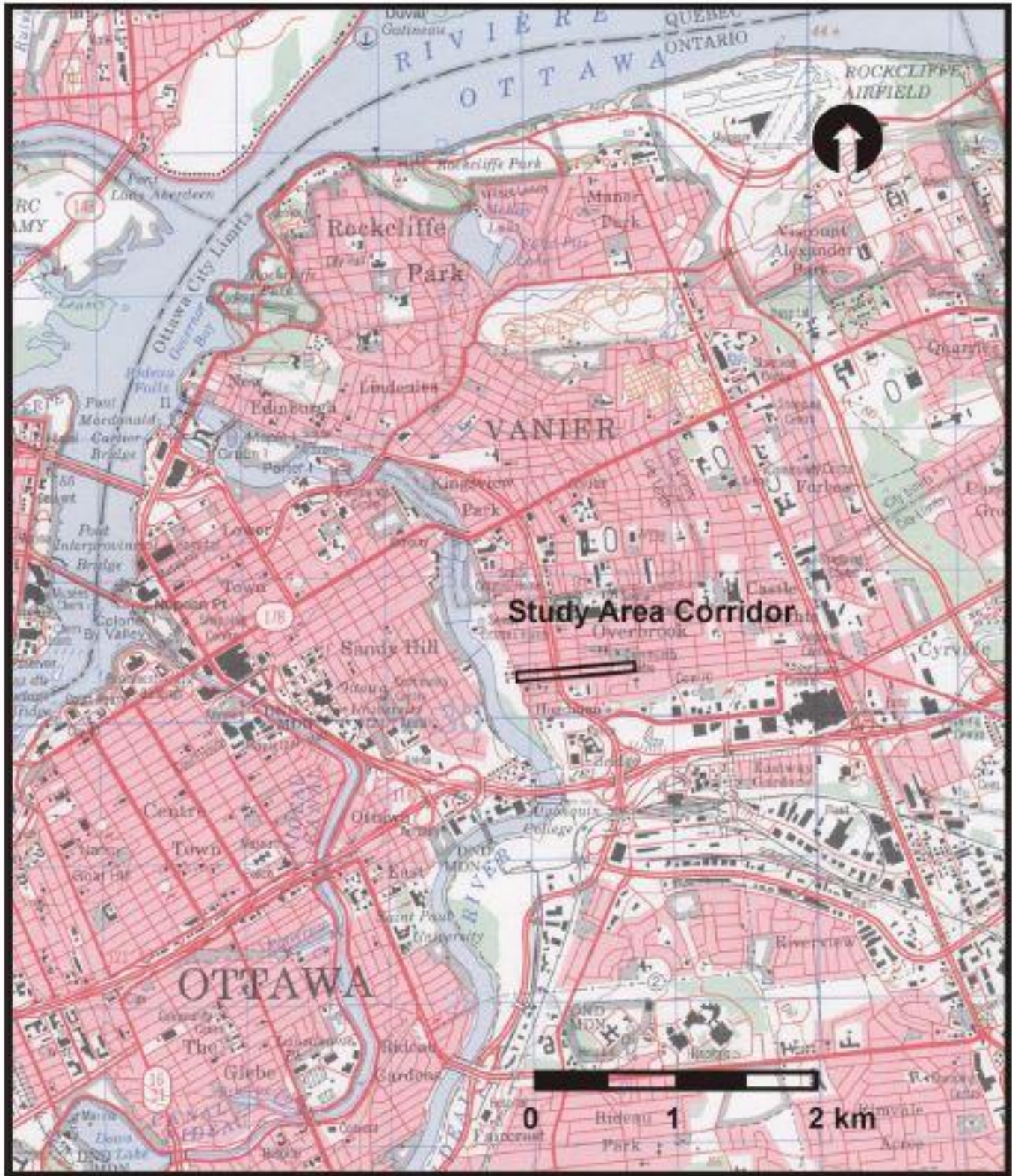
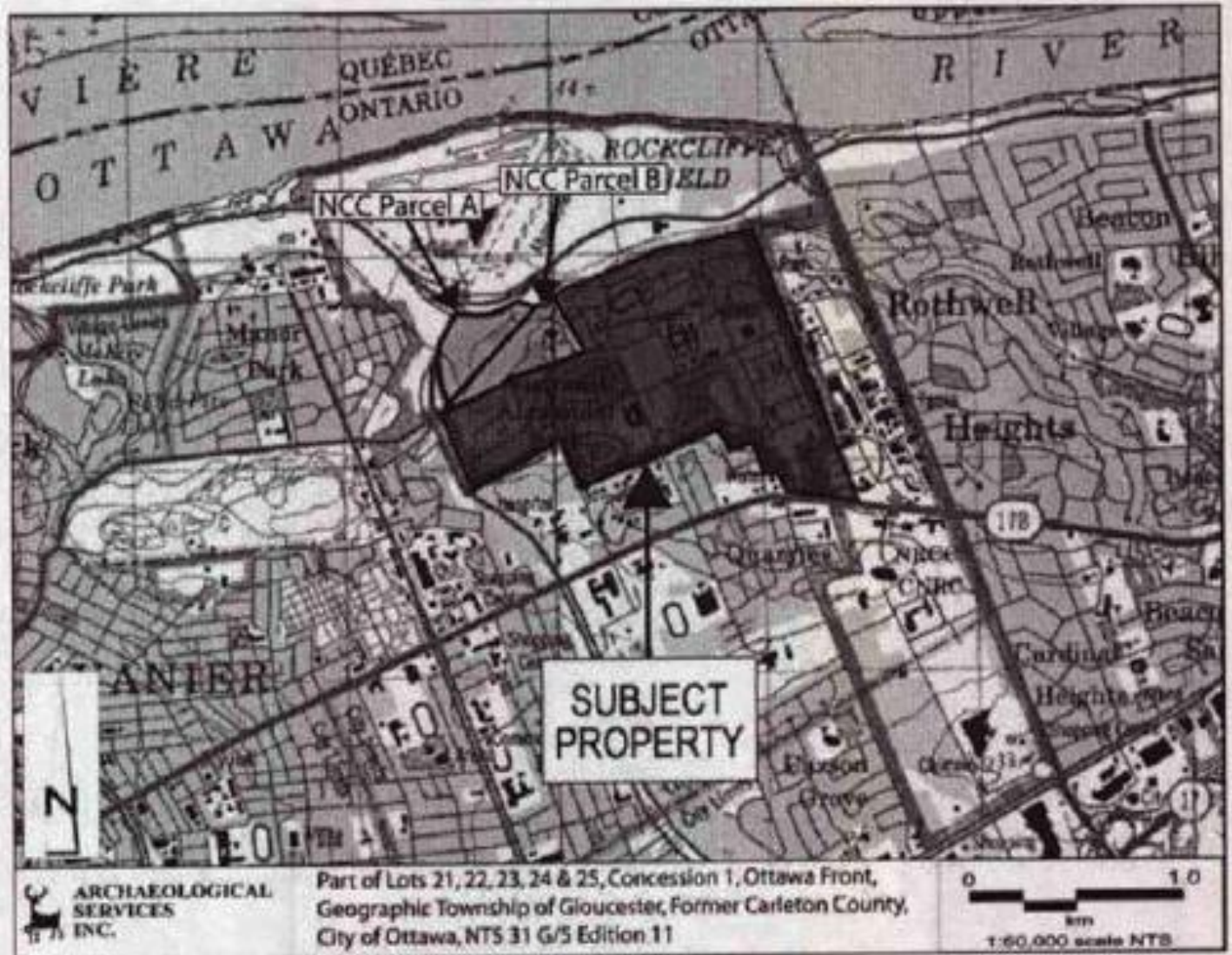


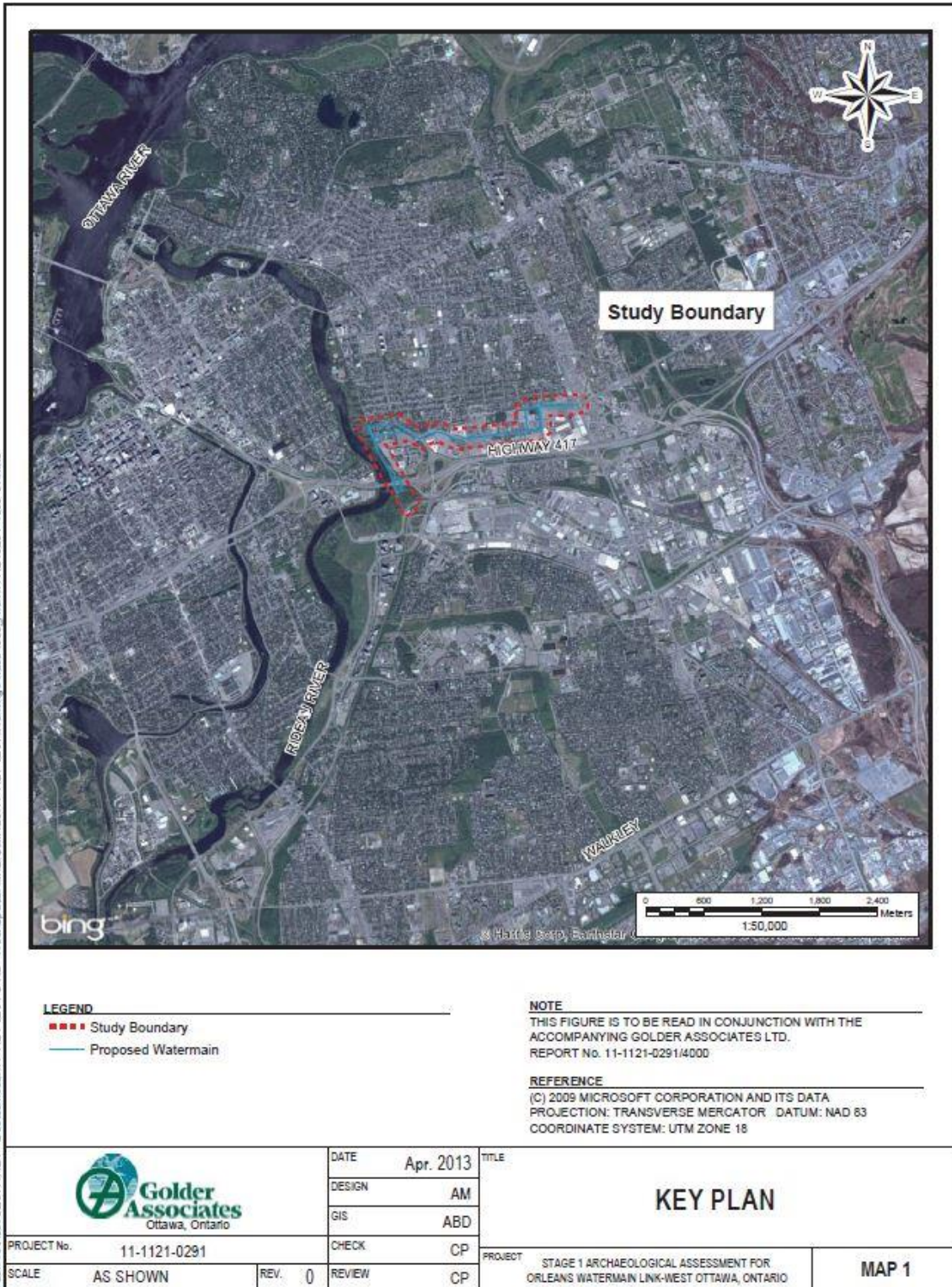
Figure 1. Queen Mary Street study area.

Map 8: Heritage Quest 2006 Stage I Queen Mary Street Project Area

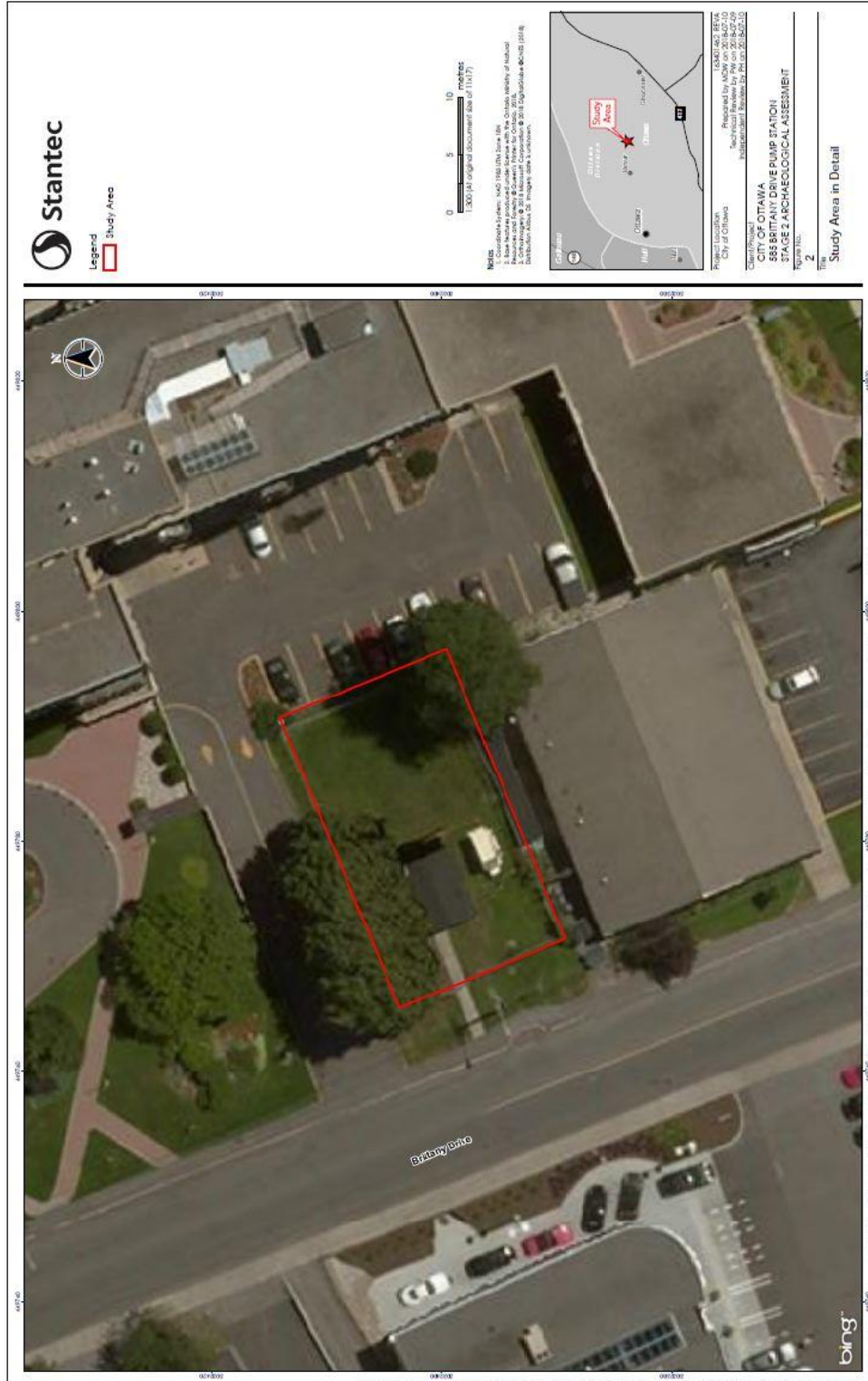
Figure 1: Location of Subject Property



Map 9: ASI 2007 Stage 2 Project Area



Map 10: Golder 2013 Stage I Project Area



Map 12: Stantec 2018 Stage 2 Project Area



Map 13: TMHC 2019a Stage I Project Area

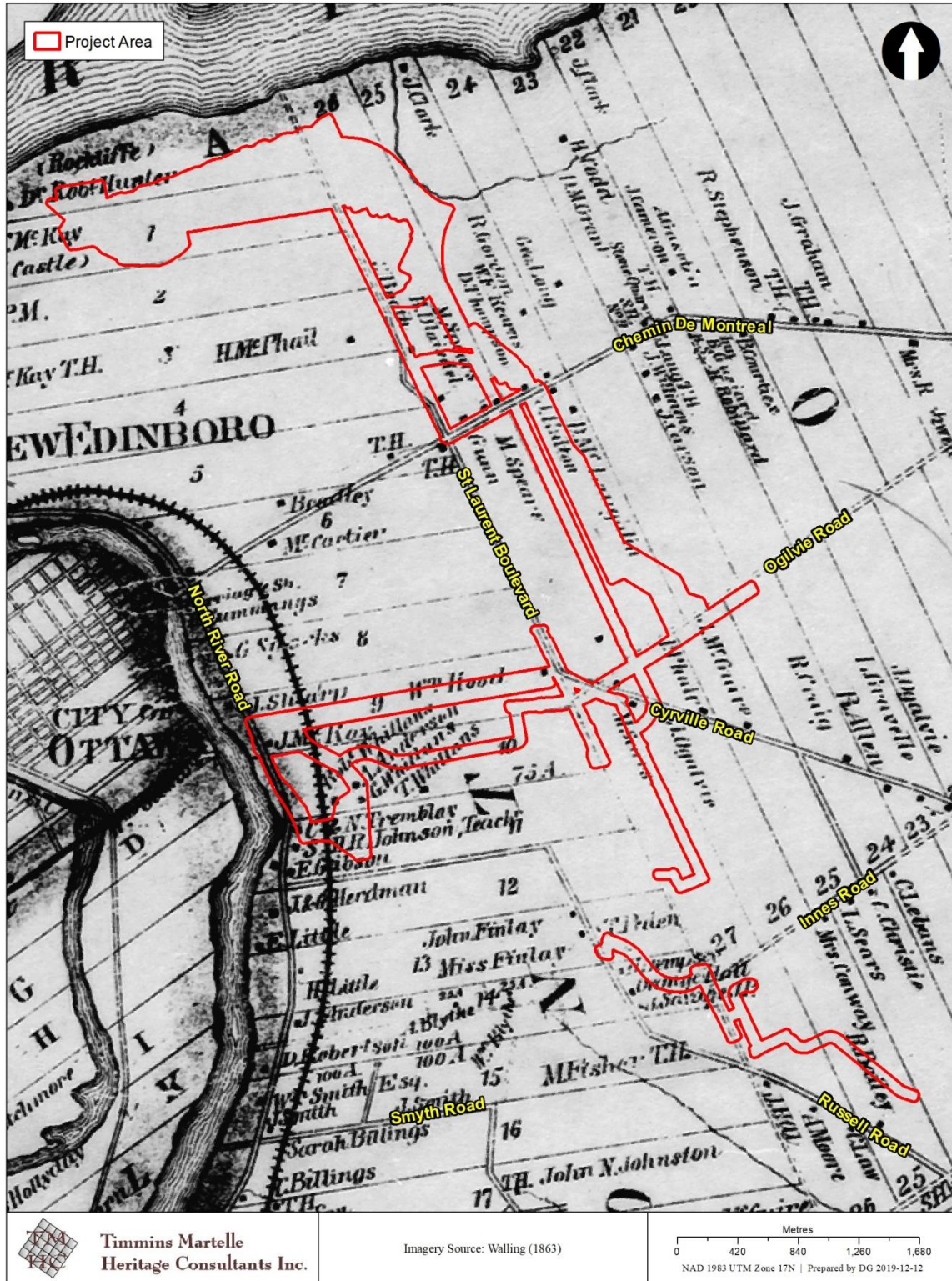


Map 14: TMHC 2019b Stage 2 Assessment – Segment I

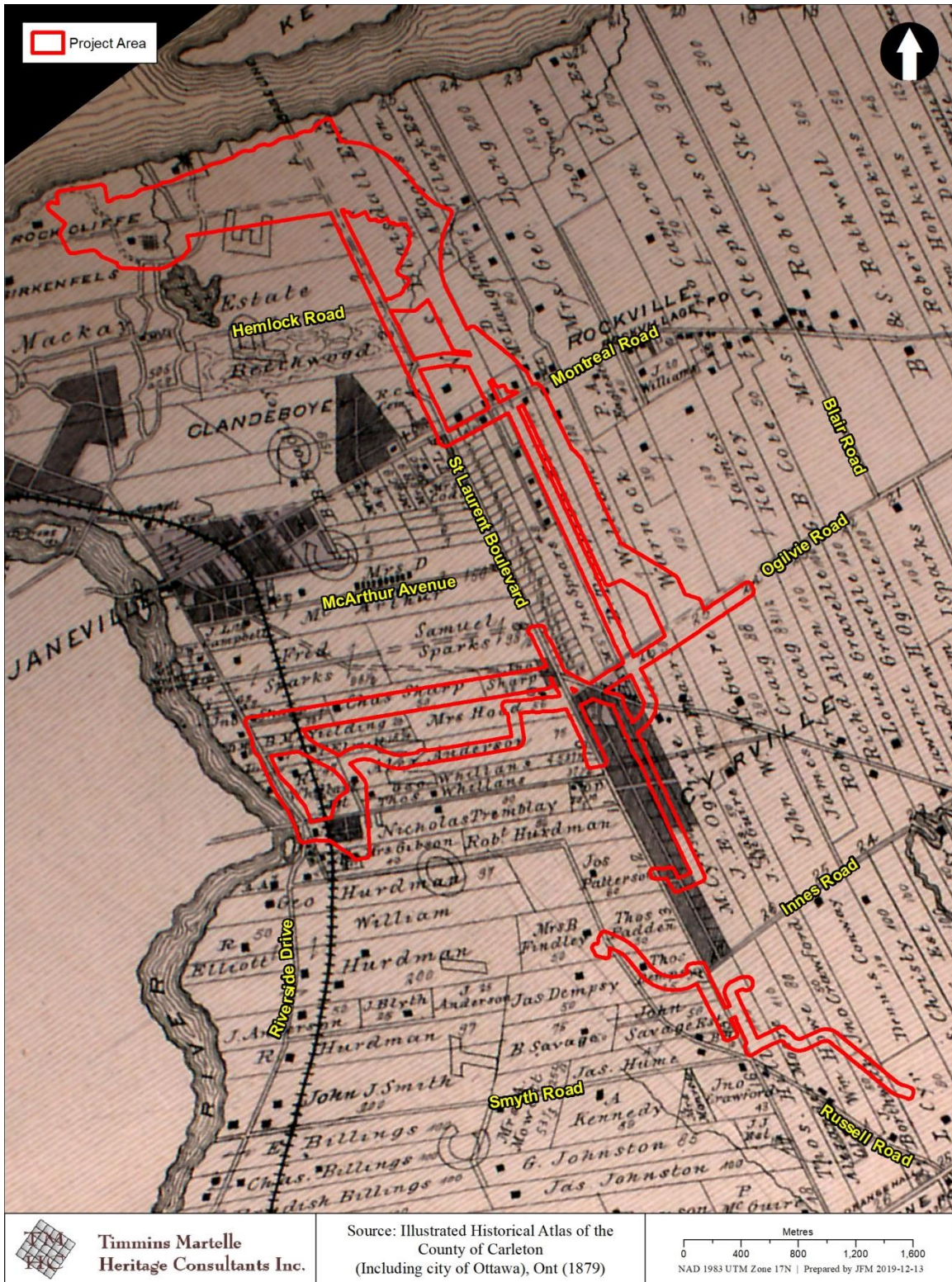


Map 15: TMHC 2019b Stage 2 Assessment – Segment 2





Map 18: Project Area Shown on the Walling 1863 Map of the Carleton County, ON



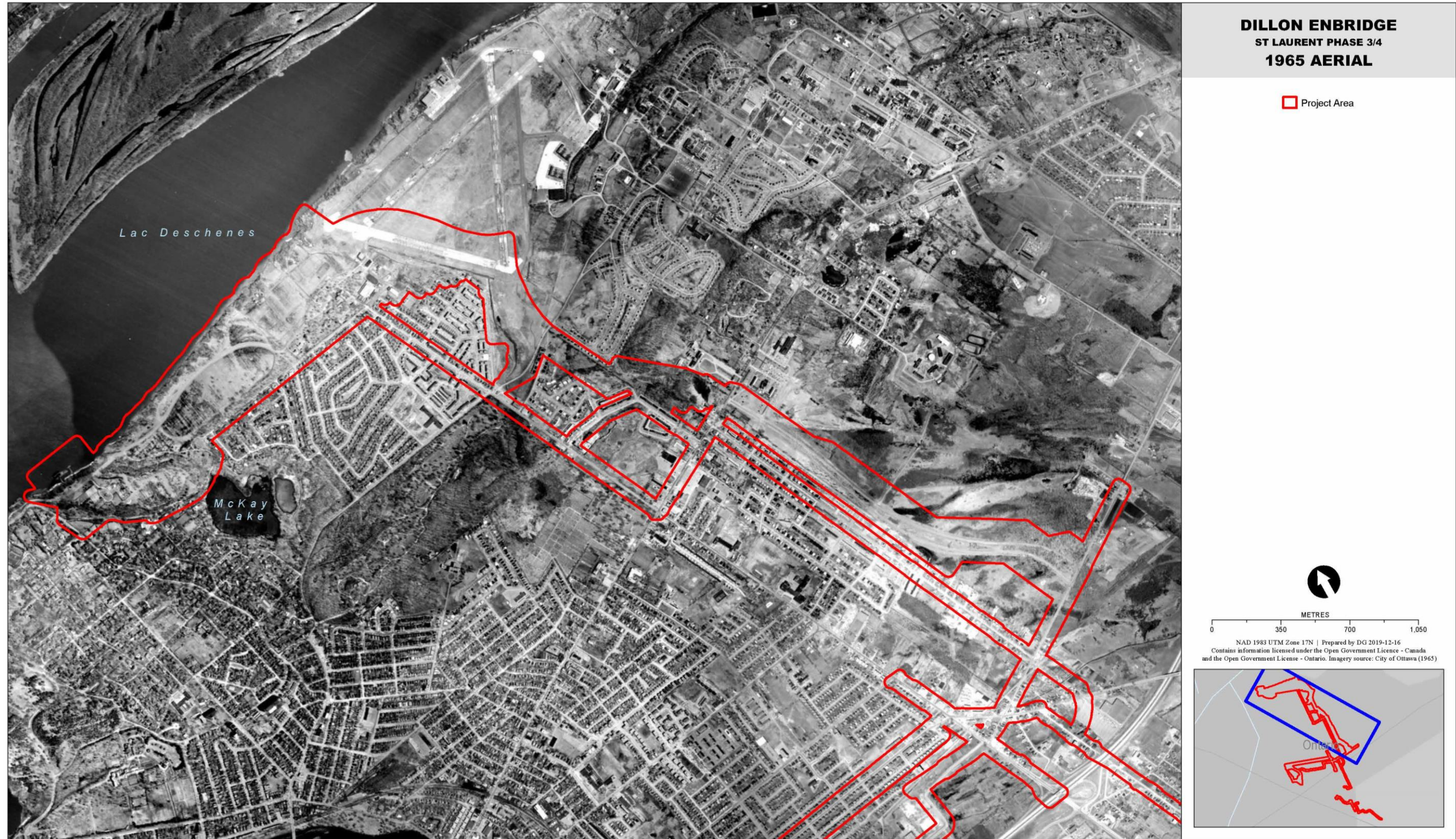
Map 19: Project Area Shown on the 1879 Map of the City of Ottawa, ON



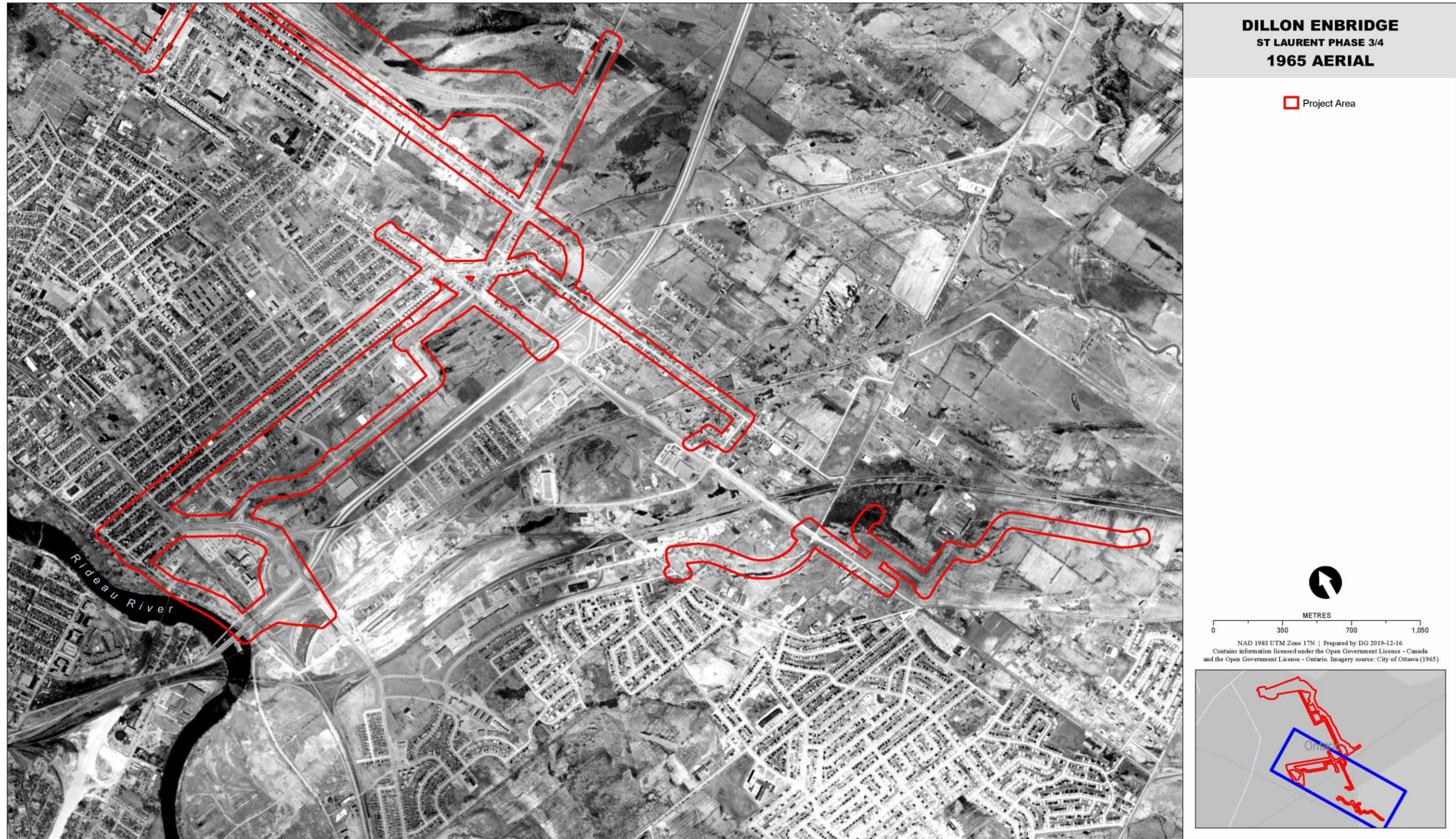
Map 20: Project Area Shown on 1928 Aerial Photograph



Map 21: Project Area Shown on 1958 Aerial Photograph



Map 22: Project Area Shown on 1965 Aerial Photograph - I



Map 23: Project Area Shown on 1965 Aerial Photograph - 2



Map 24: Project Area Shown on 1976 Aerial Photograph - I



Map 25: Project Area Shown on 1976 Aerial Photograph - 2



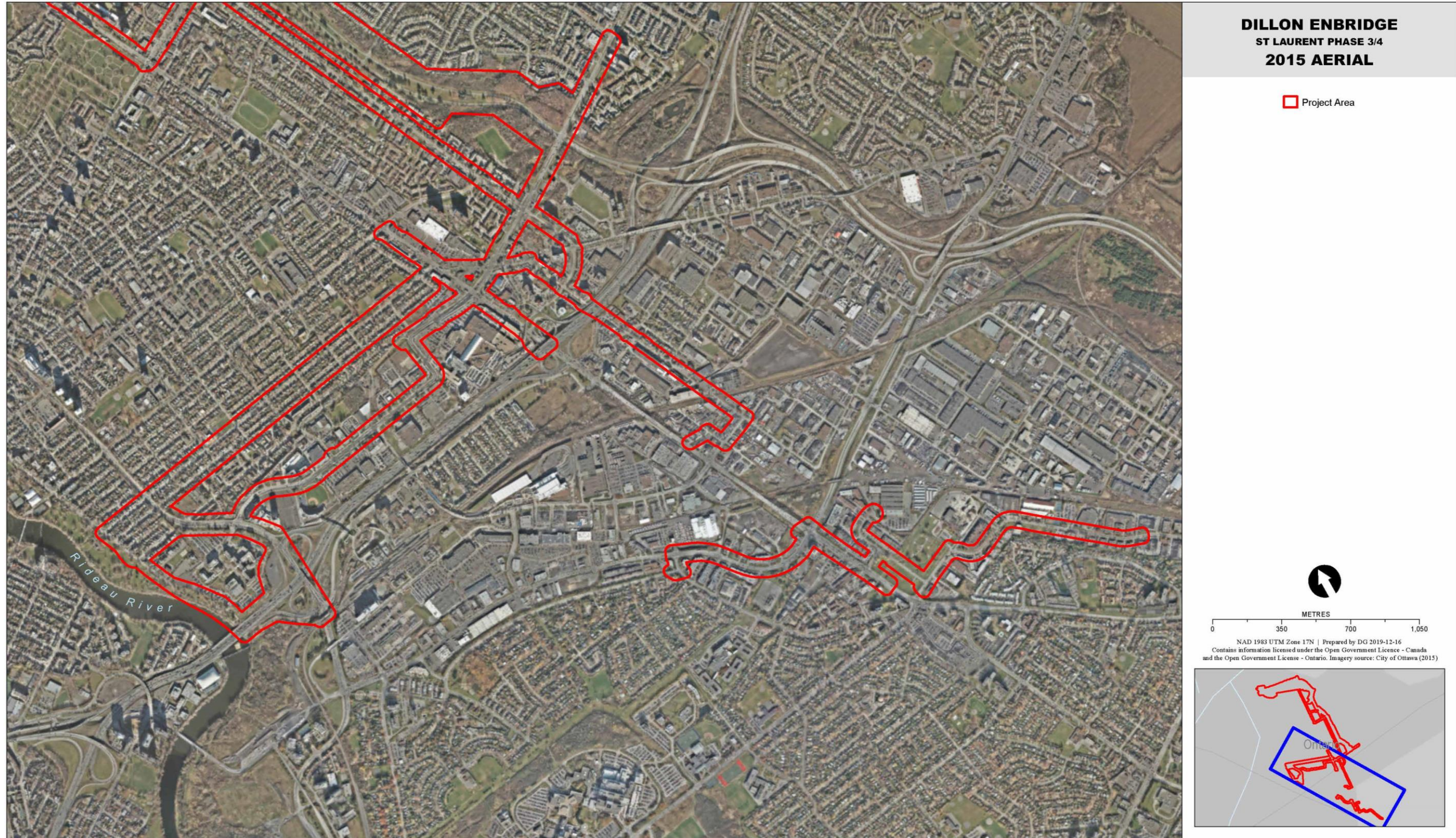
Map 26: Project Area Shown on 2002 Aerial Photograph - I



Map 27: Project Area Shown on 2002 Aerial Photograph - 2



Map 28: Project Area Shown on 2015 Aerial Photograph - I



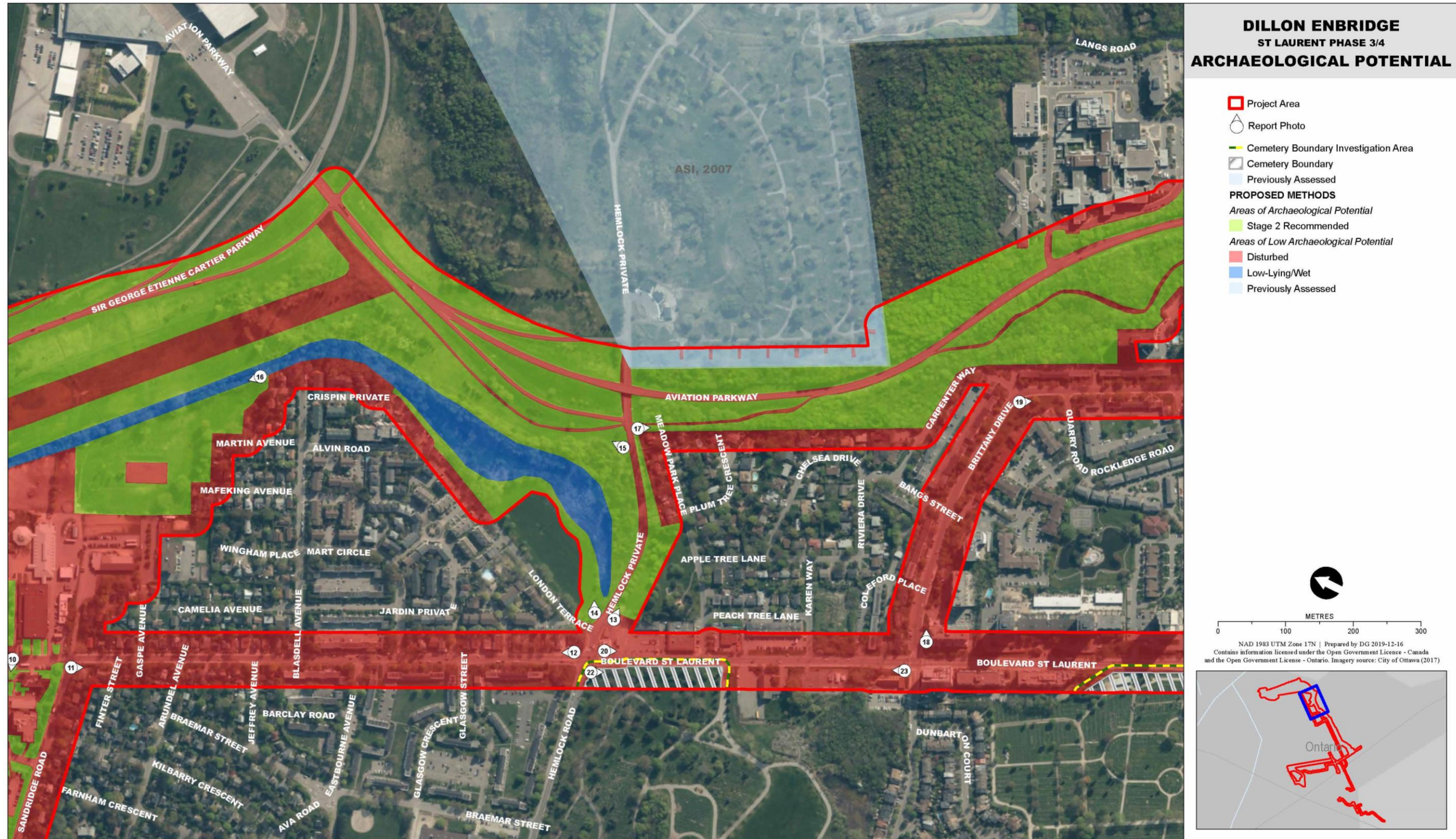
Map 29: Project Area Shown on 2015 Aerial Photograph - 2



Map 30: Stage I Areas of Archaeological Potential – Section I



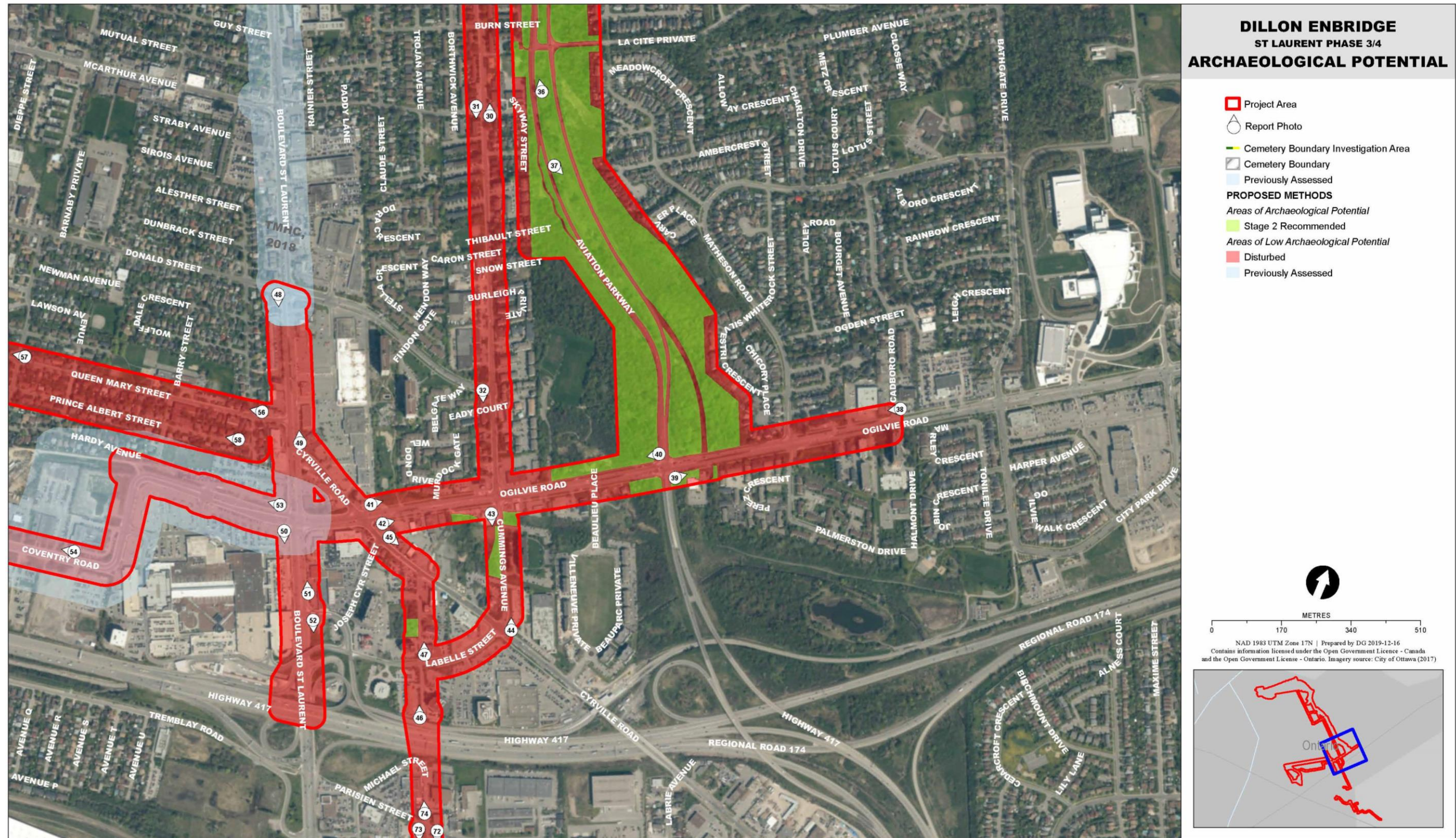
Map 31: Stage I Areas of Archaeological Potential – Section 2



Map 32: Stage I Areas of Archaeological Potential – Section 3



Map 33: Stage I Areas of Archaeological Potential – Section 4



Map 34: Stage I Areas of Archaeological Potential – Section 5



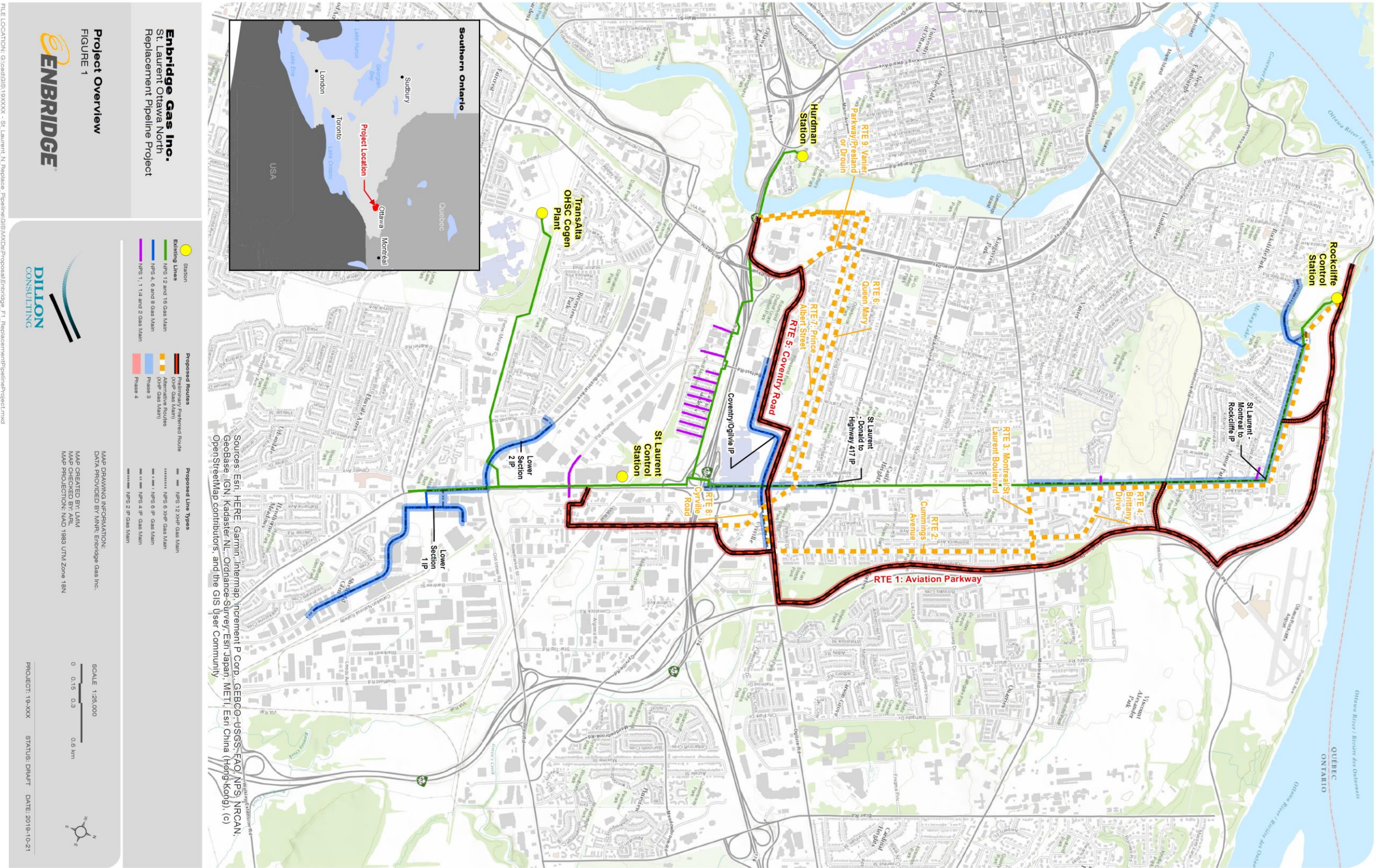
Map 35: Stage I Areas of Archaeological Potential – Section 6



Map 36: Stage I Areas of Archaeological Potential – Section 7



Map 37: Stage I Areas of Archaeological Potential – Section 8



Map 38: Proponent Mapping

Appendix B

Cultural Heritage Checklist

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
 - is a recognized heritage property
 - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
 - the main project area
 - temporary storage
 - staging and working areas
 - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

St. Laurent Pipeline Project Phase 3 and 4

Project or Property Location (upper and lower or single tier municipality)

City of Ottawa

Proponent Name

Dillon Consulting Limited

Proponent Contact Information

Tristan Lefler, tlefler@dillon.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the <i>Ontario Heritage Act</i> as being of cultural heritage value?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. a National Historic Site (or part of)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. designated under the <i>Heritage Railway Stations Protection Act</i> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. designated under the <i>Heritage Lighthouse Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. has or is adjacent to a known burial site and/or cemetery?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. is in a Canadian Heritage River watershed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. contains buildings or structures that are 40 or more years old?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. has a special association with a community, person or historical event?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. contains or is part of a cultural heritage landscape?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
 - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's [Ontario Heritage Toolkit](#) or [Standards and Guidelines for Conservation of Provincial Heritage Properties](#).

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

- i. designated under the *Ontario Heritage Act*
 - individual designation (Part IV)
 - part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note:** To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
 - [Ontario Heritage Trust](#)
 - local land registry office (for a title search)
-

ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- [Ontario Heritage Trust](#) - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
 - municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
 - local land registry office (for a title search)
-

iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
 - municipal heritage planning staff
 - municipal heritage committee
-

iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act*. **Note:** To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
 - [Ontario Heritage Trust](#)
-

- v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the [National Historic Sites website](#).

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the [Directory of Designated Heritage Railway Stations](#).

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the [Heritage Lighthouses of Canada](#) website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the [Federal Heritage Buildings Review Office](#).

See a [directory of all federal heritage designations](#).

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – [World Heritage Site website](#).

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- [municipal heritage committees](#) or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's [Heritage directory](#) – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a [list of plaques](#) commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a [list of plaques](#) commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a [database of registered cemeteries](#)
- Ontario Genealogical Society (OGS) – to [locate records of Ontario cemeteries](#), both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to [locate early cemeteries](#)

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the [Canadian Heritage River System](#).

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide [Heritage Property Evaluation](#).

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- [municipal heritage committees](#) or local heritage organizations
- Ontario Historical Society's "[Heritage Directory](#)" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through [Ontario Trails](#).

Appendix C

Routing Constraints Analysis

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



Table C1 Notes:

1. The North-South portion of the Phase 4 Preferred Route includes the alignment from Rockcliffe Control Station following Sir George-Étienne Cartier Parkway to the Aviation Parkway, which it follows for most of its length before briefly turning west along Ogilvie Road and then running south along Michael Street
2. The Project footprint encompasses 30 metre (m) on each side of the potential routes (centreline) for a total width of 60 m
3. Community services and institutions may include schools, emergency services, hospitals, long-term care homes, etc.
4. The number of multi-use trails and pathways in the Project footprint does not indicate number of intersections (i.e., there could be one pathway in the footprint that is intersected multiple times)
5. The amount of land categorized as Residential and Commercial/Institutional is based on Ecological Land Classification studies conducted for the Project and corresponds to areas classified as CVR (Residential) and CVC (Commercial/Institutional)

Table C1: Comparison of Phase 4 XHP Preferred Route (North-South Portion) to Phase 4 XHP North-South Alternatives 1, 2, 3 and 4

Criteria	Phase 4 XHP Preferred Route (North-South Portion) ¹	Phase 4 XHP North-South Alternative 1	Phase 4 XHP North-South Alternative 2	Phase 4 XHP North-South Alternative 3	Phase 4 XHP North-South Alternative 4
Waterbodies (Naturally Occurring Lakes or Ponds) in Project Footprint ²	0	0	0	0	0
Watercourses (Rivers and Streams) in Project Footprint	5	1	1	1	1
Wetlands in Project Footprint	5	0	0	1	1
Areas of Natural or Scientific Interest in Project Footprint	0	0	0	0	0
Community Services and Institutions ³ in Project Footprint (number)	2	5	5	5	5
Parks and Open Spaces in Project Footprint (number)	3	4	4	4	4
Multi-use Trails and Pathways ⁴ in Project Footprint (number)	1	3	3	3	3
Approximate Amount of National Capital Commission (NCC) Land in Project Footprint (hectares)	33.82	5.82	5.82	5.82	5.82

Criteria	Phase 4 XHP Preferred Route (North-South Portion)¹	Phase 4 XHP North-South Alternative 1	Phase 4 XHP North-South Alternative 2	Phase 4 XHP North-South Alternative 3	Phase 4 XHP North-South Alternative 4
Approximate Amount of Land in Project Footprint Categorized as Residential ⁵ (hectares)	5.41	15.00	16.74	14.60	16.34
Approximate Amount of Land in Project Footprint Categorized as Commercial/Institutional ⁵ (hectares)	13.15	14.22	13.21	9.73	8.72
Approximate Route Length (kilometres [km])	11.59	8.76	8.61	8.08	7.93
Federally-owned Roads (number of crossings)	1	1	1	1	1
Provincial Highways (number of crossings)	0	0	0	0	0
Arterial Roads (number of crossings)	7	5	6	5	5
Collector Roads (number of crossings)	4	5	5	6	6
Local Roads (number of crossings)	34	57	61	61	60
Rail Corridors (number of crossings)	1	1	1	1	1
Electricity Transmission Corridors (number of crossings)	1	1	1	1	1

Table C2 Notes:

1. The East-West portion of the Phase 4 Preferred Route includes the alignment running west from the intersection of Aviation Parkway and Ogilvie Road along Ogilvie Road and then Coventry Road to the Vanier Parkway, which it follows south to Highway 417 and then west towards the Rideau River
2. The Project footprint encompasses 30 m on each side of the potential routes (centreline) for a total width of 60 m
3. Community services and institutions may include schools, emergency services, hospitals, long-term care homes, etc.
4. The number of multi-use trails and pathways in the Project footprint does not indicate number of intersections (i.e., there could be one pathway in the footprint that is intersected multiple times)
5. The amount of land categorized as Residential and Commercial/Institutional is based on Ecological Land Classification studies conducted for the Project and corresponds to areas classified as CVR (Residential) and CVC (Commercial/Institutional)

Table C2: Comparison of Phase 4 XHP Preferred Route (East-West Portion) to Phase 4 XHP East-West Alternatives 1, 2, 3A, 3B, 4A, and 4B

Criteria	Phase 4 XHP Preferred Route (East-West Portion)¹	Phase 4 XHP East-West Alternative 1	Phase 4 XHP East-West Alternative 2	Phase 4 XHP East-West Alternative 3A	Phase 4 XHP East-West Alternative 3B	Phase 4 XHP East-West Alternative 4A	Phase 4 XHP East-West Alternative 4B
Waterbodies (Naturally Occurring Lakes or Ponds) in Project Footprint ²	0	0	0	0	0	0	0
Watercourses (Rivers and Streams) in Project Footprint	1	2	0	1	1	1	1
Wetlands in Project Footprint	0	0	0	0	0	0	0
Areas of Natural or Scientific Interest in Project Footprint	0	0	0	0	0	0	0
Community Services and Institutions ³ in Project Footprint (number)	2	4	1	4	4	1	1
Parks and Open Spaces in Project Footprint (number)	3	2	0	3	3	2	2
Multi-use Trails and Pathways ⁴ in Project Footprint (number)	4	3	2	4	4	3	4

Criteria	Phase 4 XHP Preferred Route (East-West Portion)¹	Phase 4 XHP East-West Alternative 1	Phase 4 XHP East-West Alternative 2	Phase 4 XHP East-West Alternative 3A	Phase 4 XHP East-West Alternative 3B	Phase 4 XHP East-West Alternative 4A	Phase 4 XHP East-West Alternative 4B
Approximate Amount of NCC Land in Project Footprint (hectares)	0.01	1.84	1.67	0.45	0.35	0.33	0.23
Approximate Amount of Land in Project Footprint Categorized as Residential ⁵ (hectares)	1.32	8.18	10.09	8.65	8.68	10.55	10.58
Approximate Amount of Land in Project Footprint Categorized as Commercial/Institutional ⁵ (hectares)	11.16	3.93	4.28	5.60	5.59	5.25	5.21
Approximate Route Length (km)	3.16	4.03	4.04	4.73	4.71	4.82	4.72
Federally-owned Roads (number of crossings)	0	0	0	0	0	0	0
Provincial Highways (number of crossings)	0	0	0	0	0	0	0
Arterial Roads (number of crossings)	2	3	3	4	5	6	5
Collector Roads (number of crossings)	2	2	3	4	4	5	4
Local Roads (number of crossings)	7	21	21	26	24	24	22
Rail Corridors (number of crossings)	0	0	0	0	0	0	0
Electricity Transmission Corridors (number of crossings)	2	2	2	2	2	3	2

Appendix D

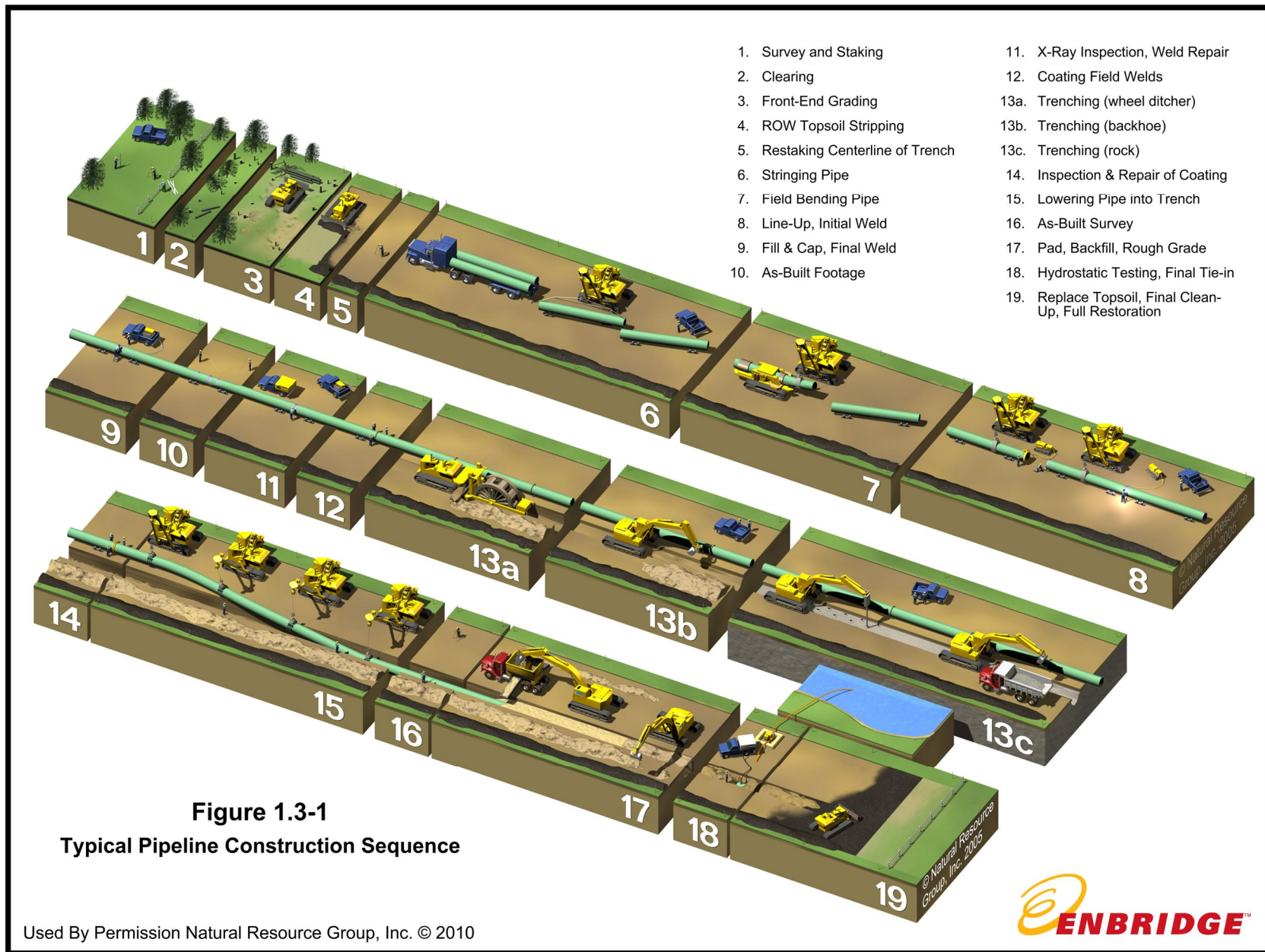
Typical Pipeline Construction Sequence

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850





1. Survey and Staking
2. Clearing
3. Front-End Grading
4. ROW Topsoil Stripping
5. Restaking Centerline of Trench
6. Stringing Pipe
7. Field Bending Pipe
8. Line-Up, Initial Weld
9. Fill & Cap, Final Weld
10. As-Built Footage
11. X-Ray Inspection, Weld Repair
12. Coating Field Welds
- 13a. Trenching (wheel ditcher)
- 13b. Trenching (backhoe)
- 13c. Trenching (rock)
14. Inspection & Repair of Coating
15. Lowering Pipe into Trench
16. As-Built Survey
17. Pad, Backfill, Rough Grade
18. Hydrostatic Testing, Final Tie-in
19. Replace Topsoil, Final Clean-Up, Full Restoration

Figure 1.3-1
Typical Pipeline Construction Sequence

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Appendix E

Contact List

Surname	First Name	Organization	Department	Title or Role	Address	City, Town, Province	Postal Code	Telephone	E-Mail
Federal and Provincial Elected Officials									
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Surname	First Name	Organization	Department	Title or Role	Address	City, Town, Province	Postal Code	Telephone	E-Mail
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Holmes	Moira	St-Laurent Academy	Administration	Director of Finance and Human Resources	641 Sladen Avenue	Ottawa, ON	K1K 2S8	613-842-8047	admin@st-laurentacademy.com
Mingardi	Maurizio	Mount Zion Church of the Firstborn	Community Group	Pastor	715 St Laurent Boulevard	Ottawa, ON	K1K 3A6	613-744-7578	
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		St. Laurent Shopping Centre	Shopping Centre Administration		1200 St Laurent Boulevard	Ottawa, ON	K1K 3B8	613-745-6858	gst.laurent@morguard.com
		VIA Rail Canada	Customer Service		PO Box 8116, SUCC Centre-Ville	Montreal, QC	H3C 3N3	1-888-842-7245	customer_relations@viarail.ca
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		Wateridge Village - Rockcliffe	Real Estate Developer (MattamyHomes.com)		895 Montreal Road	Ottawa, ON	K1K 4B9	613-421-7127	sls_wateridge@mattamycorp.com
		U-Haul Moving and Storage of Ottawa	Customer Service		383 Coventry Road	Ottawa, ON	K1K 2C5	613-741-7220	
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McCabe	Shannon	Ontario Pipeline Coordinating Committee	Ministry of Energy, Northern Development and Mines	Senior Advisor, Indigenous Energy Unit	6th Floor, 77 Grenville Street	Toronto, ON	M7A 2C1	416-212-6704	Shannon.McCabe@ontario.ca
Churchyard	Arthur	Ontario Pipeline Coordinating Committee	Ministry of Agriculture, Food and Rural Affairs	Land Use Policy & Stewardship, Policy Advisor	3rd Floor South, 1 Stone Road	Guelph, ON	N1G 4Y2	226-962-2838	arthur.churchyard@ontario.ca
Difabio	Tony	Ontario Pipeline Coordinating Committee	Ministry of Transportation (Highway Corridor Management)	Team Lead	Garden City Tower, 2nd Floor, 301 St. Paul Street	St. Catharines, ON	L2R 7R4	905-704-2656	Tony.difabio@ontario.ca
Renwick	Sally	Ontario Pipeline Coordinating Committee	Ministry of Natural Resources and Forestry	Team Lead, Environmental Planning Section	300 Water Street	Peterborough, ON	K9J 8M5	705-755-5195	sally.renwick@ontario.ca
Grace	Patrick	Ontario Pipeline Coordinating Committee	Infrastructure Ontario (Lands Transactions, Hydro Corridor/Public Works)	Director	1 Dundas Street West, Suite 2000	Toronto, ON	M5G 2L5	416-327-2959	Patrick.Grace@infrastructureontario.ca

Surname	First Name	Organization	Department	Title or Role	Address	City, Town, Province	Postal Code	Telephone	E-Mail
Cronier	Sarah	Algonquins of Ontario	Consultation Office	Cultural Heritage Program Coordinator	31 Riverside Drive, Suite 101	Pembroke, ON	K8A 8R6		scronier@tanakiwin.com

Appendix F

Notice of Study Commencement and Open House

PROPOSED ST. LAURENT OTTAWA NORTH REPLACEMENT PIPELINE PROJECT

NOTICE OF STUDY COMMENCEMENT AND OPEN HOUSE

CITY OF OTTAWA, ONTARIO

ENBRIDGE GAS INC.

The Study

Enbridge Gas Inc. (Enbridge) has retained Dillon Consulting Limited (Dillon) to begin an environmental study for approximately 20 kilometres (km) of natural gas pipeline. The project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South. The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline. Once the study is complete, Enbridge may apply to the Ontario Energy Board (OEB) for approval to construct the project. If approved, construction of Phase 3 may begin in spring 2021 and construction of Phase 4 may begin in spring 2022.

The proposed routing is depicted in the figure to the right. Enbridge has identified the preferred routes for the proposed IP plastic mains, which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments. There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers. Enbridge has identified a preliminary preferred route for the proposed NPS 12-inch and NPS 6-inch XHP steel gas mains, as well as several alternative routes/route combinations. The preliminary preferred route for the north-south portion of the pipeline runs from the Rockcliffe Control Station and follows Sir George-Étienne Cartier Parkway to Aviation Parkway, which it then follows for most of its length. The preliminary preferred route for the east-west portion of the pipeline runs from the intersection of Aviation Parkway and Ogilvie Road and runs west along Ogilvie Road and then Coventry Road to the Rideau River.

The Process

The study is being conducted in accordance with the OEB's *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario*. The study will review the need and justification for the pipeline, describe the natural and socio-economic environment, evaluate the project from a social and environmental perspective, outline safety measures, and describe appropriate measures for impact mitigation and monitoring.

Invitation to the Community

Stakeholder consultation is a key component of this study. Members of the general public, regulatory agencies, Indigenous communities and interest group representatives are invited to participate in the study. We are hosting a drop-in style Open House to provide you with an opportunity to review the project and provide input.

Location: Paroisse Saint-Louis-Marie-de-Montfort (749 Trojan Ave.)

Date: February 25, 2020 (Tuesday)

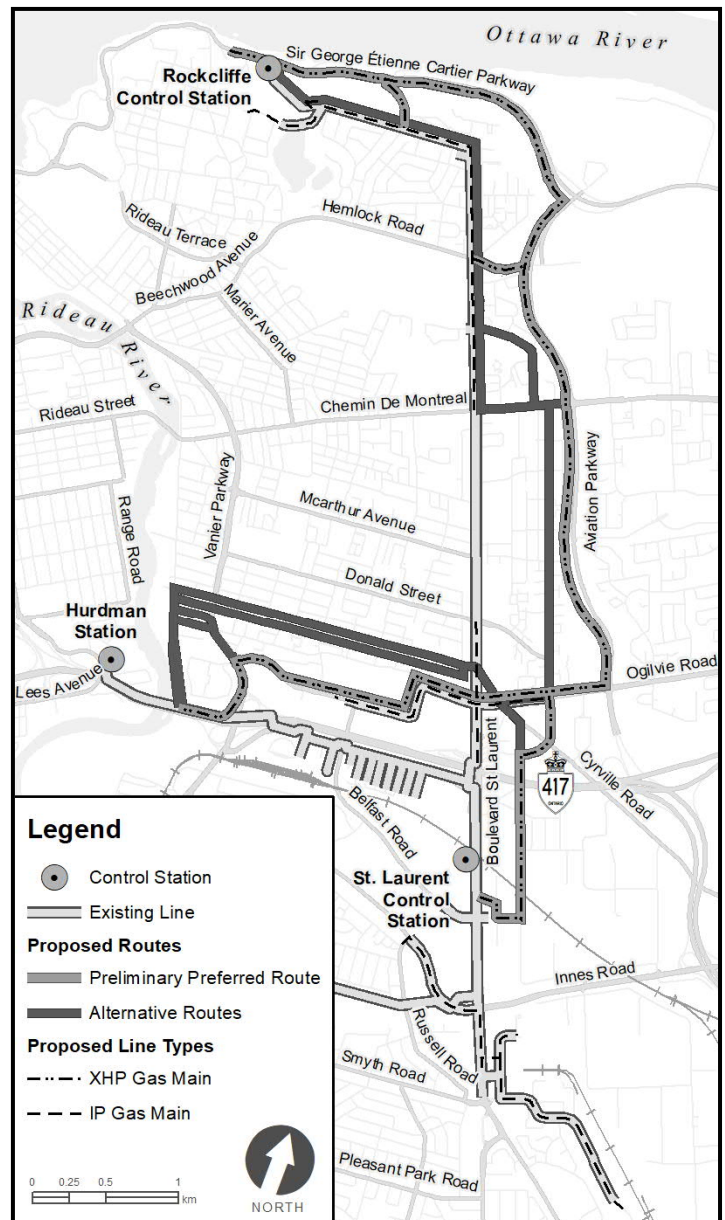
Time: 5 PM to 8 PM



Representatives from Enbridge and Dillon will be in attendance to discuss the project and answer questions. Your input will be used to confirm the preferred route and create mitigation plans to be implemented during construction. If you are interested in participating, or would like to provide comments, please come to the meeting or contact one of the individuals listed. The last day to submit comments for consideration in the environmental study is March 25, 2020.

Tanya Turk
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Tristan Lefler
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Project Manager
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PROJET PROPOSÉ DE REMPLACEMENT DU PIPELINE ST-LAURENT-OTTAWA NORD

AVIS DE COMMENCEMENT DE L'ÉTUDE ET PORTES OUVERTES

VILLE D'OTTAWA, ONTARIO

ENBRIDGE GAS INC.

L'ÉTUDE

Enbridge Gas Inc. (Enbridge) a retenu les services de Dillon Consulting Limited (Dillon) pour commencer une étude environnementale sur le remplacement d'un pipeline de gaz naturel d'environ 20 kilomètres (km). Le projet vise à remplacer environ 13 km d'un pipeline existant de gaz naturel en acier à pression ultra élevée (le pipeline St-Laurent) située le long du boulevard St-Laurent dans Vanier et Ottawa Sud. Le projet envisagé constitue les Phases 3 et 4 d'un plan à quatre phases pour remplacer le pipeline existant du boulevard St-Laurent. La Phase 1 a été parachevée et la Phase 2 est en cours de construction. La Phase 3 comprend l'installation de nouvelles conduites à gaz à pression intermédiaire afin de continuer à servir les clients en gaz naturel, puisque le tracé du pipeline de remplacement proposé dévie du tracé actuel. Pour sa part, la Phase 4 comprend l'installation d'un pipeline de diamètre nominal (NPS) de 12 pouces et d'un nouveau NPS de 6 pouces pour remplacer le pipeline existant du boulevard St-Laurent. Une fois l'étude complétée, Enbridge pourra soumettre sa candidature à la Commission de l'énergie de l'Ontario afin d'obtenir l'autorisation de réaliser le projet. Si ce dernier est approuvé, la construction de la Phase 3 pourrait commencer au printemps 2021 et celle de la Phase 4 au printemps 2022.

Le tracé proposé est décrit dans l'illustration de droite. Enbridge a repéré des tracés de prédilection pour les conduites de plastique proposées, qui sont des segments de pipeline NPS de 2 pouces, 4 pouces et 6 pouces. Il n'y a pas de solution de rechange pour ces lignes, étant donné qu'elles doivent être installées dans le secteur afin de continuer d'approvisionner les clients existants en gaz naturel. Enbridge a déterminé un tracé préliminaire de prédilection pour les pipelines de gaz en acier de NPS de 12 pouces et de 6 pouces ainsi que plusieurs tracés de rechange/combinaisons de tracés. Le tracé préliminaire de prédilection pour la portion nord-sud du pipeline commence à la station de contrôle Rockcliffe et suit la promenade de Sir-George-Étienne-Cartier jusqu'à la promenade de l'Aviation, qu'il continue de suivre pour la majeure partie de son trajet. Le tracé préliminaire de prédilection pour la portion est-ouest du pipeline commence à l'intersection de la promenade de l'Aviation et de la route Ogilvie, et il se prolonge vers l'ouest le long de la route Ogilvie, puis de la route Coventry jusqu'au canal Rideau.

LA PROCÉDURE

L'étude est menée conformément aux *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario* de la Commission de l'énergie de l'Ontario. L'étude évalue le besoin et la raison d'être du pipeline, décrit l'environnement naturel et socioéconomique, évalue le projet d'un point de vue social et environnemental, expose les mesures de sécurité et décrit les mesures appropriées pour atténuer et surveiller l'impact du pipeline.

INVITATION À LA COMMUNAUTÉ

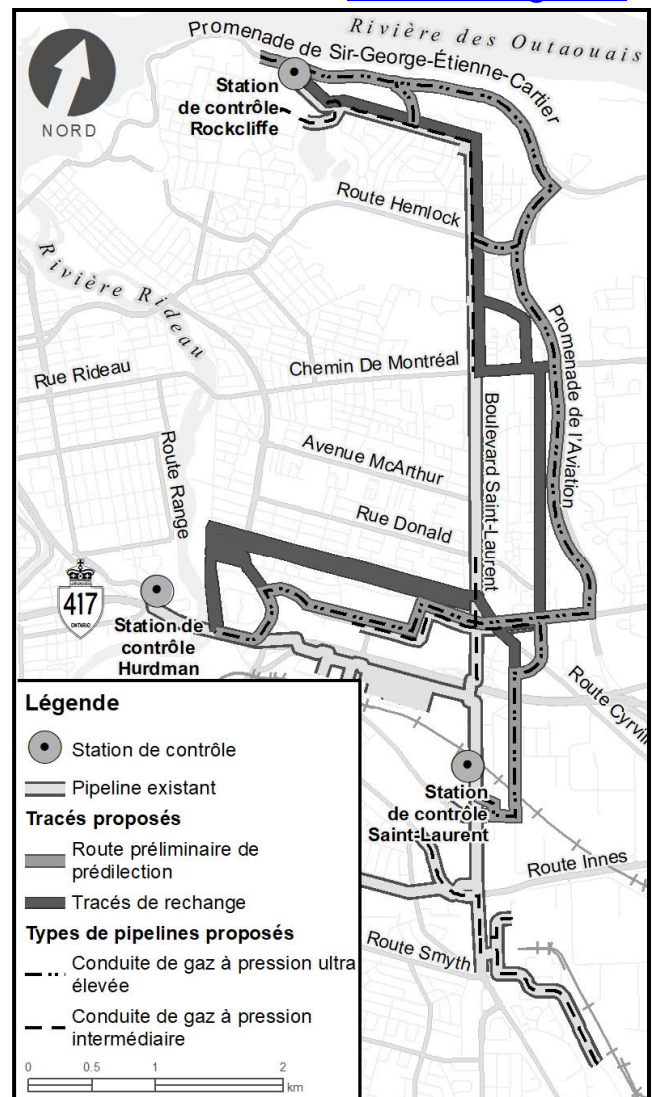
La consultation des intervenants est un élément clé de cette étude. Les membres du grand public, les organismes de réglementation, les communautés autochtones et les représentants des divers groupes d'intérêts sont invités à participer à l'étude. Nous organisons une rencontre de type portes-ouvertes pour vous donner l'occasion d'examiner le projet et de nous faire part de vos commentaires.

Endroit: P paroisse Saint-Louis-Marie-de-Montfort (749, avenue Trojan)
Date: Le 25 février 2020 (mardi)
Heure: De 17 h à 20 h

Des représentants d'Enbridge et de Dillon seront présents pour discuter du projet et répondre aux questions. Votre opinion servira à confirmer le tracé de prédilection et à élaborer des plans d'atténuation des impacts à mettre en place durant la période de construction. Si vous souhaitez participer ou nous faire part de votre opinion, venez nous rencontrer ou communiquez avec l'une des deux personnes dont les coordonnées sont fournies ci-dessous. Le dernier jour pour soumettre vos commentaires afin qu'ils soient pris en compte dans l'étude environnementale est le 25 mars 2020.

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Tristan Lefler
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Appendix G

Stakeholder Consultation Logs

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



Agency Correspondence

Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
Federal Officials/Agencies					
1.1	February 13, 2020	Member of Parliament (MP), Ottawa-Vanier Contact: Mona Fortier	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
2.1	February 13, 2020	MP, Ottawa South Contact: David McGuinty	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
3.1	February 13, 2020	Impact Assessment Agency of Canada (IAAC) Contact: Anjala Puvananathan	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
4.1	February 13, 2020	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Contact: Lina Letiecq	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
5.1	February 13, 2020	Environment and Climate Change Canada (ECCC) Contact: Sandro Leonardelli	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
5.2	February 17, 2020	ECCC Contact: Wesley Plant	ECCC representative asked if any part of the Project will take place on federal land.	February 18, 2020	Dillon representative responded that portions of the Project will occur on National Capital Commission (NCC) lands and that Enbridge has been consulting with NCC about their federal land use approval requirements.
5.3	February 20, 2020	ECCC Contact: Denise Fell	ECCC representative called Dillon Project Manager and discussed need for coordination between ECCC and NCC to ensure both agencies are in agreement on natural environment surveys required for the Project and potential permitting requirements. Dillon representative provided NCC contact information to ECCC representative.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
5.4	February 20, 2020	ECCC Contact: Denise Fell	ECCC representative sent an email following up on phone conversation with Dillon representative. ECCC representative summarized the phone conversation and copied the Project NCC contact to further facilitate discussions related to coordination of permitting and federal environmental assessment requirements.	N/A	N/A
5.5	March 23, 2020	ECCC Contact: Denise Fell	Dillon representative emailed ECCC representative a Terms of Reference document summarizing the natural environment field surveys and archaeological assessments completed to date, as well as upcoming field work planned for 2020. Dillon representative requested input on the proposed, upcoming field studies to confirm they meet ECCC requirements. Dillon representative also included a copy of the Stage 1 Archaeological Assessment. Dillon representative inquired whether review timelines would be affected by the current public health situation related to COVID-19.	March 23, 2020	ECCC representative introduced the person at ECCC who would be handling the Project file and indicated that that individual would be touch with Dillon to discuss ECCC timelines and next steps. ECCC representative requested that Dillon representative forward any existing baseline Project information for review in the interim. ECCC representative stated they would have to confirm review timelines with their wildlife experts.
5.6	March 23, 2020	ECCC Contact: Denise Fell	Dillon representative thanked ECCC representative for the prompt reply and indicated that the Environmental Report was currently being compiled and could be shared with ECCC in mid-April. For the interim, Dillon representative provided a copy of the Project notice letter shared with agencies in February. Dillon representative asked that ECCC representative provide an update, when available, on potential review timelines.	N/A	N/A
5.7	March 26, 2020	ECCC Contact: Vikash Narine	Dillon representative emailed ECCC representative requesting feedback on Dillon's proposed upcoming Western Chorus Frog (WCF) surveys and whether there was new or updated ECCC guidance or protocols that should be followed.	March 27, 2020	ECCC representative responded, providing a copy of a more recent version of the WCF survey protocol. ECCC representative stated that they would send over comments the following week on the Terms of Reference document that Dillon provided to ECCC on March 23.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
5.8	March 30, 2020	ECCC Contact: Vikash Narine	ECCC representative thanked Dillon representative for opportunity to comment on the Terms of Reference document provided to ECCC on March 23. Further to the WCF survey protocol provided via email the previous week (March 27), ECCC representative provided additional guidelines for Butternut assessments and bat surveys.	March 30, 2020	Dillon representative thanked ECCC representative for their feedback.
5.9	March 31, 2020	ECCC Contact: Vikash Narine	Dillon representative requested a phone call to discuss the bat habitat survey protocols recommended by ECCC in their March 30th email.	March 31, 2020	ECCC representative indicated a time they could meet the following day.
5.10	March 31, 2020	ECCC Contact: Vikash Narine	Dillon representative agreed on the meeting time and indicated they would send out a calendar invitation.	N/A	N/A
5.11	April 1, 2020	ECCC Contact: Vikash Narine and Paul Johanson	Conference call between Dillon and ECCC representatives. The parties came to an agreement on the bat habitat survey protocols to use for the Project.	N/A	N/A
6.1	February 13, 2020	Fisheries and Oceans Canada (DFO), Fisheries Protection Program	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
7.1	February 13, 2020	Health Canada Contact: Aurelia Thevenot	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
7.2	February 20, 2020	Health Canada Contact: Dae Young Lee	Health Canada representative thanked Dillon representative for the Project letter and Notice of Commencement and outlined Health Canada's role in regard to impact assessments. Health Canada representative invited Dillon representative to reach out should there be any specific questions related to Health Canada's impact assessment guidance.	February 27, 2020	Dillon representative thanked the Health Canada representative for the information and noted they would be in contact should any specific questions related to human health or Health Canada guidance arise.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
8.1	February 13, 2020	Transport Canada	Dillon representative sent Project letter and Notice of Commencement via email.	March 12, 2020	Transport Canada representative thanked Dillon representative for the Project letter and Notice of Commencement. Transport Canada representative indicated that proponents must self-assess whether their project requires Transport Canada review and, if so, to follow-up with Transport Canada outlining their expected role. Transport Canada representative also provided a list of legislation that has commonly applied to projects requiring Transport Canada review in an environmental assessment context.
8.2	March 16, 2020	Transport Canada	Dillon representative thanked Transport Canada representative for the information. Dillon representative noted that there were no current circumstances in relation to the Project that would require Transport Canada review, but, should that change, Transport Canada would be engaged in the environmental assess process, as required.	N/A	N/A
9.1	February 13, 2020	NCC Contact: Natalie Glancy	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
9.2	February 25, 2020	NCC	Enbridge and Dillon representatives met with NCC representatives at NCC office in Ottawa to discuss the Project.	N/A	N/A
9.3	February 26, 2020	NCC Contact: Christopher Meek	NCC representative emailed Enbridge representative and asked for information on the Project Open House including how many people attended, if any specific concerns were raised in regard to NCC land, and the extent of advertising/notice that was provided to the community and City Councillors.	February 28, 2020	Enbridge representative responded to NCC representative's questions and provided a copy of the Project contact list.
9.4	March 16, 2020	NCC Contact: Christopher Meek	Enbridge representative sent NCC representative an email asking for comments on the Project design drawing.	N/A	N/A
9.5	March 22, 2020	NCC Contact: Céline Desormeaux	Enbridge representative sent NCC representative an email asking for confirmation on whether or not the NCC maintains Hillsdale Road.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
9.6	March 23, 2020	NCC Contact: Natalie Glancy	Dillon representative emailed NCC representative a Terms of Reference document summarizing the natural environment field surveys and archaeological assessments completed to date, as well as upcoming field work planned for 2020. Dillon representative requested input on the proposed, upcoming field studies to confirm they meet NCC requirements. Dillon representative also included a copy of the Stage 1 Archaeological Assessment. Dillon representative inquired whether review timelines would be affected by the current public health situation related to COVID-19.	March 24, 2020	NCC representative thanked Dillon representative for the Terms of Reference and indicated that they would leave it up to the ECCC to comment on the natural environment field studies. NCC representative stated they would like to receive a copy of the Environmental Report at the same time as ECCC in mid-April and that NCC staff were continuing to provide service from home during the pandemic. NCC representative also provided a summary of what was discussed at the in-person meeting between Enbridge, Dillon, and NCC representatives on February 25, along with a few NCC-related updates.
9.7	March 24, 2020	NCC Contact: Natalie Glancy	Dillon representative thanked NCC representative for the information and stated that their comments had been noted and would be taken into account, as appropriate, as the Project proceeds.	N/A	N/A
9.8	March 31, 2020	NCC Contact: Céline Desormeaux	Dillon representative provided an update on Project field surveys and requested an extension of their existing Land Access Permit until the end of September, in order to complete remaining spring and summer field surveys.	April 1, 2020	NCC representative thanked Dillon representative for the update and agreed to extend the permit until the end of September.
9.9	April 1, 2020	NCC Contact: Céline Desormeaux	Dillon representative thanked NCC representative.	N/A	N/A
9.10	April 1, 2020	NCC Contact: Christopher Meek	NCC representative thanked Enbridge representative for meeting with NCC representatives in February and for providing requested information following the Open House. NCC representative provided the NCC's comments on the proposed Project routing on NCC lands. Most notably, the NCC representative stated that the Phase 4 preferred route along Aviation Parkway would conflict with future plans for a new interprovincial crossing.	April 23, 2020	Enbridge representative thanked NCC representative for the comments and feedback and responded to each of the NCC's points. Enbridge representative requested a meeting to specifically discuss NCC's comment that the Phase 4 preferred route along Aviation Parkway would conflict with a new potential interprovincial crossing.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
9.11	May 15, 2020	NCC Contact: Christopher Meek	NCC representative thanked Enbridge representative for responding to the NCC's feedback. NCC representative stated they would like to arrange a meeting between Enbridge representatives and the NCC's bridge study team to explore potential project coordination and timelines. NCC representative requested that Enbridge provide some available times for a meeting for the week of June 1. NCC representative noted that in order to recommend approval of an alignment on NCC property, NCC staff must be able to demonstrate that the proposed alignment is the only reasonably feasible option under the policies of the Capital Urban Lands Plan. NCC representative requested more information to better understand the feasibility of the alternative routing along St. Laurent Boulevard and Cummings Avenue.	May 20, 2020	Enbridge representative provided a list of Enbridge staff to include in the meeting invite along with available meeting dates and times for the week of June 1. Enbridge representative noted that they were in the process of addressing the NCC's question regarding the feasibility of the alternative routing and would respond shortly.
9.12	May 20, 2020	NCC Contact: Christopher Meek	Enbridge representative followed up with the name and email of a Dillon representative to include in the meeting invite.	N/A	N/A
9.13	May 8, 2020	NCC Contact: Nicole McKeever	NCC representative contacted Dillon representative to inform them that their existing Land Access Permit is set to expire on May 30, 2020 and inquired whether an extension would be required.	May 8, 2020	Dillon representative thanked NCC representative for the notification and requested an extension until August 30, 2020.
9.14	June 3, 2020	NCC Contact: Christopher Meek	Enbridge representative provided a PowerPoint presentation in advance of the conference call with NCC, outlining the Project and why it is needed, as well as the constraints associated with the alternative routes.	N/A	N/A
9.15	June 3, 2020	NCC Contact: Christopher Meek and various other NCC Representatives	Enbridge representatives and NCC representatives met via conference call to discuss feedback on Project alignment alternatives and explore potential coordination with the future bridge project.	N/A	N/A

Enbridge Gas Inc.

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
9.16	June 8, 2020	NCC Contact: Christopher Meek	Enbridge representative thanked NCC representative for arranging the meeting with the NCC bridge team the previous week. Enbridge representative noted that, at the end of the meeting, the NCC representative stated they would send along notes/comments summarizing the NCC's position on the Aviation Parkway pipeline route. Enbridge representative kindly reminded NCC representative to provide these notes/comments at their earliest convenience, as they would assist with Enbridge's internal routing discussions.	N/A	N/A
10.1	February 13, 2020	Royal Canadian Mounted Police (RCMP) Contact: Anna Chow	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
Provincial Officials/Agencies					
11.1	February 13, 2020	Member of Provincial Parliament (MPP), Ottawa South Contact: John Fraser	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
12.1	February 13, 2020	Hydro One Networks Inc. (HONI) Contact: Rossella Fazio	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
13.1	February 13, 2020	Ministry of Indigenous Affairs Contact: David Big-Canoe	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
14.1	February 13, 2020	Ministry of Agriculture, Food and Rural Affairs (MAFRA) Contact: John O'Neill	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
15.1	February 13, 2020	Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) Contacts: Karla Barboza, Kimberly Livingstone, and Susan Golets	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
15.2	February 13, 2020	MHSTCI Contact: Karla Barboza	Dillon representative sent Project letter and Notice of Commencement via email.	February 14, 2020	MHSTCI representative thanked Dillon representative for the Project letter and Notice of Commencement. MHSTCI representative asked for clarification on relationship of the proposed Project to the St. Laurent Pipeline Project that was initiated in 2019 and stated the notice for the 2019 project was attached for reference. MHSTCI representative requested file numbers for any associated Ontario Energy Board (OEB) filings.
15.3	February 14, 2020	MHSTCI Contact: Karla Barboza	Dillon representative noted that the attachment had not come through and provided clarification on the proposed Project in relation to the previous St. Laurent Pipeline Project, as well as the associated OEB filing number.	February 18, 2020	MHSTCI representative thanked Dillon representative for the clarification and provided the attachment missing from the previous email.
15.4	February 18, 2020	MHSTCI Contact: Karla Barboza	Dillon representative responded, confirming that the attachment provided was for the previous St. Laurent Pipeline Project.	N/A	N/A
15.5	March 13, 2020	MHSTCI Contact: Kimberly Livingstone	MHSTCI representative sent an email with a letter outlining MHSTCI's role in OEB projects and providing advice on how to incorporate consideration of cultural heritage in Project planning. MHSTCI requested that they continue to be engaged on the Project throughout the OEB process.	March 16, 2020	Dillon representative thanked MHSTCI representative for the information provided in their March 13th letter and confirmed that they will continue to consult with MHSTCI, as required, throughout the OEB process.
16.1	February 13, 2020	Ministry of Education Contact: Paul Bloye	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
17.1	February 13, 2020	Ministry of Economic Development and Growth Contact: Michael Helfinger	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
18.1	February 13, 2020	Infrastructure Ontario Contact: Lisa Myslicki	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
18.2	February 24, 2020	Infrastructure Ontario Contact: Raquel Kallideen	Infrastructure Ontario representative thanked Dillon representative for Project letter and Notice of Commencement. Infrastructure Ontario representative noted that an initial review of the Project information indicates that the Project study area may overlap with hydro corridor lands owned by the Minister of Government and Consumer Services; however it is the proponent's responsibility to verify such. Infrastructure Ontario representative provided a list of names that may appear on title documents indicating property is provincially-owned. Infrastructure Ontario representative requested that they continue to be engaged as a potentially-affected stakeholder and that the proponent contact them directly about requirements for obtaining government property.	February 27, 2020	Dillon representative thanked Infrastructure Ontario representative for the information and stated that Infrastructure Ontario would continue to be engaged on the Project, as needed.
19.1	February 13, 2020	Ministry of Municipal Affairs and Housing (MMAH) Contact: Shawn Parry	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
20.1	February 13, 2020	Ministry of Natural Resources and Forestry (MNRF) Contact: Mary Dillon	Dillon representative sent Project letter and Notice of Commencement via email.	February 24, 2020	MNRF representative thanked Dillon representative for the Project letter and Notice of Commencement. MNRF representative provided information on where and how to access natural environment data, including data on species at risk, and provided additional information on potentially relevant legislation. MNRF representative stated they wish to remain engaged on the Project and requested that they be contacted with any specific questions or concerns in relation to MNRF interests.
20.2	February 27, 2020	MNRF Contact: Mary Dillon	Dillon representative thanked MNRF representative for the information and stated that MNRF would continue to be engaged on the Project, as needed.	N/A	N/A
21.1	February 13, 2020	Ministry of Transportation (MTO) Contact: Peter Makula	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
21.2	February 19, 2020	MTO Contact: Alain Nadeau	MTO representative from the Ottawa Area Office called and left a voicemail for the Enbridge Environmental Advisor on the Project. He stated that he saw the Notice of Commencement for the Project and had some questions about the scope of work near Highway 417 and interchanges.	February 19, 2020	Enbridge representative returned the MTO representative's phone call and left a voicemail acknowledging his message and requesting that he call her back, when available, to discuss the Project.
21.3	March 17, 2020	MTO Contact: Alexandre Gitkow	MTO representative sent a Project letter via email summarizing the MTO's preliminary concerns with regard to the Project routing around Highway 417 and its interchanges. MTO representative stated that the MTO was not supportive of the currently proposed routing and requested a formal response to their concerns.	March 30, 2020	Dillon representative responded, thanking MTO representative for their email and letter. Dillon representative stated that Enbridge would engage MTO at the permitting stage of the Project to obtain all necessary approvals for working in and around Highway 417 and its interchanges.
21.4	March 30, 2020	MTO Contact: Alexandre Gitkow	MTO representative responded that Enbridge should not wait until the permitting stage of the Project to further engage MTO, as it may delay Enbridge's Project schedule, should MTO not accept their plan.	N/A	N/A
21.5	March 30, 2020	MTO Contact: Alexandre Gitkow	MTO representative followed up on previous email to further clarify that Enbridge will need to specifically address all of MTO's concerns outlined in their letter dated March 17, 2020. The MTO representative stated that, prior to approaching the OEB for approval, Enbridge needs to submit a proposed routing option that addresses MTO's concerns.	May 4, 2020	Dillon representative sent a letter outlining Enbridge's formal response to each of the concerns identified in the MTO's letter of March 17, 2020.
21.6	April 21, 2020	MTO Contact: Alexandre Gitkow	Conference call between Enbridge and MTO representatives. Proposed routing around Highway 417 was discussed.	N/A	N/A
21.7	May 14, 2020	MTO Contact: Alexandre Gitkow	Dillon representative followed up to confirm that MTO representative had received Enbridge's letter of May 4, 2020.	May 14, 2020	MTO representative confirmed receipt of the May 4 letter and stated they were currently reviewing it and were awaiting additional mapping from Enbridge prior to submitting comments.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850



Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
22.1	February 13, 2020	Ministry of Environment, Conservation and Parks (MECP) Contacts: Sarah Paul and Annamaria Cross	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
23.1	February 13, 2020	Rideau Valley Conservation Authority Contact: Glen McDonald	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
24.1	February 13, 2020	Ontario Pipeline Coordinating Committee (OPCC) – OEB Representative Contact: Zora Crnojacki	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
25.1	February 13, 2020	OPCC – MHSTCI Representative Contact: Laura Hatcher	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
26.1	February 13, 2020	OPCC – Technical Standards and Safety Authority (TSSA) Representative Contact: Kouros Manouchehri	Dillon representative sent Project letter and Notice of Commencement via email.	February 14, 2020	TSSA representative responded that an Application for Review of Pipeline Project needs to be submitted to the TSSA as part of OPCC review.
27.1	February 13, 2020	OPCC – MMAH Representative Contact: Michael Elms	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
28.1	February 13, 2020	OPCC – MECP Representative Contact: Ruth Orwin	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
29.1	February 13, 2020	OPCC – Ministry of Energy, Northern Development and Mines Representative Contact: Shannon McCabe	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
30.1	February 13, 2020	OPCC – MAFRA Representative Contact: Arthur Churchyard	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
31.1	February 13, 2020	OPCC – MTO Representative Contact: Tony DiFabio	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
32.1	February 13, 2020	OPCC – MNRF Representative Contact: Sally Renwick	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
33.1	February 13, 2020	OPCC – Infrastructure Ontario Representative Contact: Patrick Grace	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
Municipal Officials/Agencies					
34.1	February 13, 2020	Ottawa Police Service	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
35.1	February 13, 2020	Hydro Ottawa	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
36.1	February 13, 2020	OC Transpo Contact: Anise Samimi	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
37.1	February 14, 2020	Mayor's Office Contact: Jim Watson	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
38.1	February 14, 2020	Councillor Jean Cloutier's Office (Ward 18) Contact: Jean Cloutier	Enbridge representative sent Project letter and Notice of Commencement via email.	February 14, 2020	Councillor responded stating she had some questions about the nature and scope of work and noted there were other proposed developments in the area that would require coordination. Councillor stated that a colleague would be in touch to set up a meeting.
38.2	February 14, 2020	Councillor Jean Cloutier's Office (Ward 18) Contact: Jean Cloutier	Enbridge representative responded that they look forward to working with the Councillor's office to discuss and coordinate Project activities.	N/A	N/A
38.3	February 18, 2020	Councillor Jean Cloutier's Office (Ward 18) Contact: Michael Reid	A representative of the Councillor's office requested information from Enbridge regarding the status of another unrelated project.	February 19, 2020	Enbridge representative responded that Enbridge representatives would be available for a meeting on February 25th and asked if the proposed date and time would work for the Councillor's office.
38.4	February 19, 2020	Councillor Jean Cloutier's Office (Ward 18) Contact: Michael Reid	Councillor's representative confirmed that the date and time of the proposed meeting would work and stated that a colleague would send along an invitation with directions.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
38.5	February 26, 2020	Councillor Jean Cloutier's Office (Ward 18) Contact: Michael Reid	Councillor's representative sent an email facilitating an introduction between Enbridge and the Perley and Rideau Veterans' Health Centre, as they were identified by Councillor Cloutier as potentially-affected stakeholders.	February 26, 2020	Enbridge representative thanked Councillor's representative for the introduction. Enbridge representative stated that they would pass along the contact details for the potentially-affected stakeholders to other colleagues at Enbridge and provided Project information for discussion at a later date.
39.1	February 14, 2020	Councillor Mathieu Fleury's Office (Ward 12) Contact: Mathieu Fleury	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
40.1	February 14, 2020	Councillor Tim Tierney's Office (Ward 11) Contact: Tim Tierney	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
41.1	February 14, 2020	Councillor Rawlson King's Office (Ward 13) Contact: Rawlson King	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
42.1	February 14, 2020	City of Ottawa – Public Works and Environmental Services Contact: Kevin Wylie	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
43.1	February 14, 2020	City of Ottawa – Transportation Services Contact: John Manconi	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
44.1	February 14, 2020	City of Ottawa – City Manager's Office Contact: Steve Kanellakos	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A
44.2	February 21, 2020	City of Ottawa – City Manager's Office Contact: Ryan Fabiani	City Manager's representative thanked Enbridge representative for the Project notice and stated that the Project information had been forwarded to Stephen Willis, General Manager of Planning, Infrastructure and Economic Development.	February 21, 2020	Enbridge representative thanked City Manager's representative for the follow-up note.
45.1	February 14, 2020	City of Ottawa – Emergency and Protective Services Contact: Anthony Di Monte	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Line Item	Date of Consultation	Name of Agency and/or Contact	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
46.1	February 14, 2020	City of Ottawa – Planning, Infrastructure and Economic Development Contact: Stephen Willis	Enbridge representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Interest Group Correspondence

Line Item	Date of Consultation	Name of Group	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
1.1	February 13, 2020	Conseil des écoles publiques de l'Est de l'Ontario	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
2.1	February 13, 2020	Ottawa Catholic School Board (OCSB)	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
2.2	March 6, 2020	OCSB	OCSB representative provided comments on the Project noting that they prefer the preliminary preferred route for the extra high pressure (XHP) pipeline. OCSB representative noted opposition to the Cummings Avenue alternative route, as construction would impact operation and access to one of their schools. OCSB representative requested that they be formally notified of all matters related to the Project should the Cummings Avenue route be chosen.	March 9, 2020	Dillon representative thanked the OCSB representative for their comments.
3.1	February 13, 2020	Ottawa-Carleton District School Board	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
4.1	February 13, 2020	Queen Elizabeth Public School	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
5.1	February 13, 2020	Our Lady of Mount Carmel School	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
6.1	February 13, 2020	National Military Cemetery of the Canadian Forces	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
7.1	February 13, 2020	Notre-Dame Cemetery	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
8.1	February 13, 2020	St. Laurent Academy	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
9.1	February 13, 2020	Mount Zion Church of the Firstborn	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
10.1	February 13, 2020	St. Laurent Complex	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Line Item	Date of Consultation	Name of Group	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
11.1	February 13, 2020	Vanier Community Association	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
12.1	February 13, 2020	Canada Aviation and Space Museum	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
13.1	February 13, 2020	Montfort Hospital	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
14.1	February 13, 2020	St. Laurent Shopping Centre	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
15.1	February 13, 2020	VIA Rail Canada	Dillon representative sent Project letter and Notice of Commencement via email.	February 28, 2020	VIA Rail Customer Relations representative thanked Dillon representative for the Project notice and apologized for the delayed response. VIA Rail Customer Relations representative provided contact information for the appropriate agent at VIA Rail to which the Project information should be forwarded.
15.2	February 28, 2020	VIA Rail Canada	Dillon representative sent Project letter and Notice of Commencement via email, noting that the Open House had passed but that the storyboard panels could be provided upon request. Dillon representative explained why VIA Rail was identified as a potentially-affected stakeholder and provided a link to the Project website.	March 4, 2020	VIA Rail representative responded stating that VIA Rail had no objection to the proposed works and provided information on regulatory and permitting requirements in relation to working around railway lines.
15.3	March 9, 2020	VIA Rail Canada	Dillon representative thanked VIA Rail representative for the information and acknowledged the permitting requirements. Dillon representative stated that Enbridge would be in contact with VIA Rail, as necessary, as the Project progresses.	March 9, 2020	VIA Rail representative thanked Dillon representative.
16.1	February 13, 2020	Wateridge Village – Rockcliffe	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
17.1	February 13, 2020	U-Haul Moving and Storage of Ottawa	Dillon representative sent Project letter and Notice of Commencement via standard mail.	N/A	N/A
18.1	February 13, 2020	Overbrook Community Association	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

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Line Item	Date of Consultation	Name of Group	Description of Consultation Activity	Date of Response	Response and Issue Resolution (if applicable)
19.1	February 13, 2020	Federation of Citizen Associations of Ottawa	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
20.1	February 13, 2020	CBC Radio	Dillon representative sent Project letter and Notice of Commencement via email.	N/A	N/A
21.1	February 26, 2020	Ottawa Community Housing Corporation (OCHC)	OCHC representative sent an email summarizing her concerns expressed at the Open House event on February 25th. OCHC representative noted that OCHC owns multiple properties along the XHP alternative routes and that they would prefer that Enbridge proceed with the preliminary preferred route. OCHC representative requested that they receive Project updates so they can pass the information along to their tenants, as needed. OCHC representative requested a copy of the Open House storyboard panels.	February 26, 2020	Dillon representative thanked OCHC representative for their feedback and acknowledged their route preference. Dillon representative provided a copy of the Open House storyboard panels.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Public Correspondence

Line Item	Date of Consultation	Contact	Description of Consultation Activity (Email)	Date of Response	Response and Issue Resolution (if applicable)
1.1	February 11, 2020	Member of the public	Individual called and left a voicemail for the Dillon Project Manager. He stated he is a property owner along the pipeline routes and had questions about access during construction, construction duration, and specific plans for the area in front of his property.	February 12, 2020	Dillon representative called individual back and explained the scope of work near his property.
1.2	February 12, 2020	Member of the public	Dillon representative sent an email to the individual following their phone conversation. The email summarized the topics discussed over the phone and the Dillon representative provided a more detailed map showing the potential pipeline routes.	February 12, 2020	Individual thanked Dillon representative for the information and noted they have another property at a different location along the potential pipeline routes and wanted to know if that property could be affected.
1.3	February 13, 2020	Member of the public	Dillon representative responded that no work was planned at the address of the individual's other property.	N/A	N/A
2.1	February 14, 2020	Member of the public	Individual called the Dillon Project Manager. She noted she had received the Notice of Commencement in the mail and cited her address. She asked questions about Project approval and if the Project would be servicing new customers and the Dillon Project Manager responded to her questions.	N/A	N/A
2.2	February 14, 2020	Member of the public	Dillon representative sent an email to the individual following their phone conversation, thanking them for their call and providing a more detailed map showing the potential pipeline routes. The Dillon representative encouraged the individual to attend the public Open House event scheduled for February 25th.	February 15, 2020	Individual thanked the Dillon representative for the information.
2.3	March 11, 2020	Member of the public	Dillon representative sent an email to the individual in response to questions and concerns posed at the Open House and on the Open House exit questionnaire.	March 12, 2020	Individual thanked the Dillon representative for the information and asked if any other members of the public had commented on the preliminary preferred route along the Aviation Parkway.
2.4	March 12, 2020	Member of the public	Dillon representative responded that there had been several comments received regarding the Aviation Parkway route and that, to date, no comments in opposition to the route had been received.	N/A	N/A
3.1	February 21, 2020	Member of the public	Individual emailed the Project inbox with questions about the route along Aviation Parkway, indicating they would be unable to attend the Project Open House scheduled for Tuesday, February 25th.	February 28, 2020	Dillon representative responded to the individual's questions.

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Line Item	Date of Consultation	Contact	Description of Consultation Activity (Email)	Date of Response	Response and Issue Resolution (if applicable)
3.2	February 28, 2020	Member of the public	Individual thanked Dillon representative for the information and asked additional questions regarding effects of construction on environmental and socio-economic elements and the rationale behind choosing the Aviation Parkway as the preferred route for the replacement pipeline. Individual also asked if there were other sources of Project information available to consult.	March 30, 2020	Dillon representative responded to the individual's questions and provided link to Project website.
4.1	April 2, 2020	Member of the public	Dillon representative sent an email to the individual in response to questions and concerns posed on the Open House exit questionnaire.	N/A	N/A
5.1	April 2, 2020	Member of the public	Dillon representative sent an email to the individual in response to questions and concerns posed on the Open House exit questionnaire.	N/A	N/A

Enbridge Gas Inc.

St. Laurent Ottawa North Replacement Pipeline Project – Appendix G: Stakeholder Consultation Logs

June 2020 – 19-1850

Appendix H

Stakeholder Letters

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850





February 13, 2020

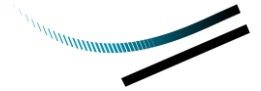
**RE: Enbridge Gas Inc.
Proposed St. Laurent Ottawa North Pipeline Replacement Project
City of Ottawa, Ontario
Notice of Study Commencement and Open House**

177 Colonnade Road
Suite 101
Ottawa, Ontario
Canada
K2E 7J4
Telephone
613.745.2213
Fax
613.745.3491

To whom it may concern,

Enbridge Gas Inc. (Enbridge) has retained Dillon Consulting Limited (Dillon) to begin an environmental study for approximately 20 kilometres (km) of natural gas pipeline. The project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South. The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline. The study is being conducted in accordance with the Ontario Energy Board (OEB) *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition*. Once the study is complete, Enbridge may apply to the OEB for approval to construct the project. If approved, construction of Phase 3 may begin prior to winter 2021 and construction of Phase 4 may begin in spring 2022.

Enbridge has identified the preferred routes for the proposed IP plastic mains, which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments. There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers. Enbridge has identified a preliminary preferred route for the proposed NPS 12-inch



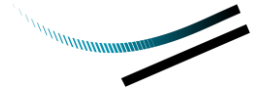
and NPS 6-inch XHP steel gas mains, as well as several alternative routes/route combinations. The preliminary preferred route for the north-south portion of the pipeline runs from the Rockcliffe Control Station and follows Sir George-Étienne Cartier Parkway to Aviation Parkway, which it then follows for most of its length. The preliminary preferred route for the east-west portion of the pipeline runs from the intersection of Aviation Parkway and Ogilvie Road and runs west along Ogilvie Road and then Coventry Road to the Rideau River. A map showing the pipeline routes is enclosed.

Stakeholder involvement will play a key role in the project. In order to undertake a successful consultation program, we have developed a mailing list of government agencies (federal, provincial, and municipal), Indigenous and community groups, residents and members of the general public that may have an interest in the study. Enbridge will also be hosting a drop-in style Open House as part of the study. Details of this Open House are provided in the enclosed Notice of Commencement.

As part of the initial phase of the study, we are collecting information on socio-economic, natural environment, and archaeological or heritage resource features along each potential route. Examples of data being collected include information on terrestrial and aquatic vegetation and wildlife, archaeological and heritage resources, community parks and facilities, nature trails, bus routes, as well as water, sewage, industrial, and commercial utilities. Planning policies and future plans for the study area are important pieces of information that will be considered when evaluating the potential routes.

We are interested in hearing from you regarding comments that you (or your organization) may have regarding this project. We are also requesting any information relating to the natural and/or human environments along the potential routes that may fall within your mandate.

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February 13, 2020



Please send this information to my attention at the above address or by email to StLaurentNorthEA@dillon.ca by **March 25, 2020**. If you require any further information at this time, please do not hesitate to contact me.

If there is a more appropriate contact at your organization who should receive this letter, please kindly forward the letter at your discretion and notify us as we will update our stakeholder consultation list.

Sincerely,

DILLON CONSULTING LIMITED

Tristan Lefler, M.Sc.
Environmental Assessment Project Manager
Phone: (519) 571-9833 Ext. 3138

Enclosures Notice of Study Commencement and Open House
 Map of Potential Routes



February 13, 2020

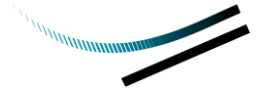
**RE: Enbridge Gas Inc.
Proposed St. Laurent Ottawa North Replacement Pipeline Project
City of Ottawa, Ontario
Notice of Study Commencement and Open House**

Dear Glen McDonald,

Enbridge Gas Inc. (Enbridge) has retained Dillon Consulting Limited (Dillon) to begin an environmental study for approximately 20 kilometres (km) of natural gas pipeline. The project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South. The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline. The study is being conducted in accordance with the Ontario Energy Board (OEB) *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition*. Once the study is complete, Enbridge may apply to the OEB for approval to construct the project. If approved, construction of Phase 3 may begin prior to winter 2021 and construction of Phase 4 may begin in spring 2022.

Enbridge has identified the preferred routes for the proposed IP plastic mains, which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments. There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers. Enbridge has identified a preliminary preferred route for the proposed NPS 12-inch

177 Colonnade Road
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K2E 7J4
Telephone
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Fax
613.745.3491



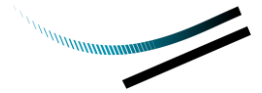
and NPS 6-inch XHP steel gas mains, as well as several alternative routes/route combinations. The preliminary preferred route for the north-south portion of the pipeline runs from the Rockcliffe Control Station and follows Sir George-Étienne Cartier Parkway to Aviation Parkway, which it then follows for most of its length. The preliminary preferred route for the east-west portion of the pipeline runs from the intersection of Aviation Parkway and Ogilvie Road and runs west along Ogilvie Road and then Coventry Road to the Rideau River. A map showing the pipeline routes is enclosed.

Stakeholder involvement will play a key role in the project. In order to undertake a successful consultation program, we have developed a mailing list of government agencies (federal, provincial, and municipal), Indigenous and community groups, residents and members of the general public that may have an interest in the study. Enbridge will also be hosting a drop-in style Open House as part of the study. Details of this Open House are provided in the enclosed Notice of Commencement.

As part of the initial phase of the study, we are collecting information on socio economic, natural environment, and archaeological or heritage resource features along each potential route. Examples of data being collected include information on terrestrial and aquatic vegetation and wildlife, archaeological and heritage resources, community parks and facilities, nature trails, bus routes, as well as water, sewage, industrial, and commercial utilities. Planning policies and future plans for the study area are important pieces of information that will be considered when evaluating the potential routes.

We are interested in hearing from you regarding comments that you (or your organization) may have regarding this project. We are also requesting any information relating to the natural and/or human environments along the potential routes that may fall within your mandate and in particular whether the following are within, or in the vicinity of, the potential routes:

- environmentally sensitive areas;



- floodplains; and,
- distinctive natural features that would warrant protection.

Please send this information to my attention at the above address or by email to StLaurentNorthEA@dillon.ca by **March 25, 2020**. If you require any further information at this time, please do not hesitate to contact me.

If there is a more appropriate contact at your organization who should receive this letter, please kindly forward the letter at your discretion and notify us as we will update our stakeholder consultation list.

Sincerely,

DILLON CONSULTING LIMITED

Tristan Lefler, M.Sc.
Environmental Assessment Project Manager
Phone: (519) 571-9833 Ext. 3138

Enclosures Notice of Study Commencement and Open House
 Map of Potential Routes



February 13, 2020

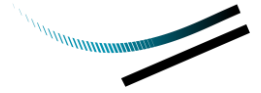
**RE: Enbridge Gas Inc.
Proposed St. Laurent Ottawa North Replacement Pipeline Project
City of Ottawa, Ontario
Notice of Study Commencement and Open House**

Dear Mary Dillon,

Enbridge Gas Inc. (Enbridge) has retained Dillon Consulting Limited (Dillon) to begin an environmental study for approximately 20 kilometres (km) of natural gas pipeline. The project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South. The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline. The study is being conducted in accordance with the Ontario Energy Board (OEB) *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition*. Once the study is complete, Enbridge may apply to the OEB for approval to construct the project. If approved, construction of Phase 3 may begin prior to winter 2021 and construction of Phase 4 may begin in spring 2022.

Enbridge has identified the preferred routes for the proposed IP plastic mains, which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments. There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers. Enbridge has identified a preliminary preferred route for the proposed NPS 12-inch

177 Colonnade Road
Suite 101
Ottawa, Ontario
Canada
K2E 7J4
Telephone
613.745.2213
Fax
613.745.3491



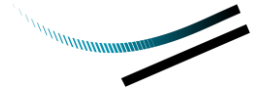
and NPS 6-inch XHP steel gas mains, as well as several alternative routes/route combinations. The preliminary preferred route for the north-south portion of the pipeline runs from the Rockcliffe Control Station and follows Sir George-Étienne Cartier Parkway to Aviation Parkway, which it then follows for most of its length. The preliminary preferred route for the east-west portion of the pipeline runs from the intersection of Aviation Parkway and Ogilvie Road and runs west along Ogilvie Road and then Coventry Road to the Rideau River. A map showing the pipeline routes is enclosed.

Stakeholder involvement will play a key role in the project. In order to undertake a successful consultation program, we have developed a mailing list of government agencies (federal, provincial, and municipal), Indigenous and community groups, residents and members of the general public that may have an interest in the study. Enbridge will also be hosting a drop-in style Open House as part of the study. Details of this Open House are provided in the enclosed Notice of Commencement.

As part of the initial phase of the study, we are collecting information on socio economic, natural environment, and archaeological or heritage resource features along each potential route. Examples of data being collected include information on terrestrial and aquatic vegetation and wildlife, archaeological and heritage resources, community parks and facilities, nature trails, bus routes, as well as water, sewage, industrial, and commercial utilities. Planning policies and future plans for the study area are important pieces of information that will be considered when evaluating the potential routes.

We are interested in hearing from you regarding comments that you (or your organization) may have regarding this project. We are also requesting any information relating to the natural and/or human environments along the potential routes that may fall within your mandate and in particular whether any of the following are within, or in the vicinity of, the potential routes:

- wetlands;



- woodlands;
- environmentally sensitive areas;
- rare, threatened, or endangered species occurrences and/or habitat present;
- areas of natural and scientific interest; and,
- any distinctive natural features that would warrant protection.

Please send this information to my attention at the above address or by email to StLaurentNorthEA@dillon.ca by **March 25, 2020**. If you require any further information at this time, please do not hesitate to contact me.

If there is a more appropriate contact at your organization who should receive this letter, please kindly forward the letter at your discretion and notify us as we will update our stakeholder consultation list.

Sincerely,

DILLON CONSULTING LIMITED

Tristan Lefler, M.Sc.
Environmental Assessment Project Manager
Phone: (519) 571-9833 Ext. 3138

Enclosures Notice of Study Commencement and Open House
 Map of Potential Routes



February 13, 2020

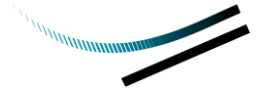
**RE: Enbridge Gas Inc.
Proposed St. Laurent Ottawa North Replacement Pipeline Project
City of Ottawa, Ontario
Notice of Study Commencement and Open House**

177 Colonnade Road
Suite 101
Ottawa, Ontario
Canada
K2E 7J4
Telephone
613.745.2213
Fax
613.745.3491

To whom it may concern,

Enbridge Gas Inc. (Enbridge) has retained Dillon Consulting Limited (Dillon) to begin an environmental study for approximately 20 kilometres (km) of natural gas pipeline. The project is required to replace approximately 13 km of an existing extra high pressure (XHP) steel natural gas pipeline (St. Laurent Pipeline) that is currently located along St. Laurent Boulevard in Vanier and Ottawa South. The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction. Phase 3 involves the installation of new intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route. Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline. The study is being conducted in accordance with the Ontario Energy Board (OEB) *Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition*. Once the study is complete, Enbridge may apply to the OEB for approval to construct the project. If approved, construction of Phase 3 may begin prior to winter 2021 and construction of Phase 4 may begin in spring 2022.

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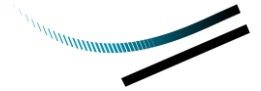
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We are interested in hearing from you regarding comments that you (or your organization) may have regarding this project. We are also requesting any information relating to the natural and/or human environments along the potential routes that may fall within your mandate and, in particular, more information on the following:

- current Official Plan designations;
- current zoning;



- presence of any environmentally sensitive areas/designations in the Official Plan along the potential routes; and,
- whether any part of the potential routes are within a designated groundwater recharge or discharge area in the Official Plan.

Please send this information to my attention at the above address or by email to StLaurentNorthEA@dillon.ca by **March 25, 2020**. If you require any further information at this time, please do not hesitate to contact me.

If there is a more appropriate contact at your organization who should receive this letter, please kindly forward the letter at your discretion and notify us as we will update our stakeholder consultation list.

Sincerely,

DILLON CONSULTING LIMITED

Tristan Lefler, M.Sc.
Environmental Assessment Project Manager
Phone: (519) 571-9833 Ext. 3138

Enclosures Notice of Study Commencement and Open House
 Map of Potential Routes

Appendix I

Open House Storyboard Panels

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



Proposed St. Laurent Ottawa North Replacement Pipeline Project



**Welcome to our
Public Open House**

Welcome

Who we are

Enbridge Gas Inc. (Enbridge) provides safe and reliable delivery of natural gas to more than 3.7 million residential, commercial, and industrial customers across Ontario, Quebec, and New Brunswick. Enbridge is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.

Why are we here?

- To provide information about the proposed St. Laurent Ottawa North Replacement Pipeline Project and present the potential routes.
- To provide affected landowners and the public the opportunity to discuss the proposed Project with Enbridge and Dillon.
- To receive input from affected landowners and the general public regarding any issues to be addressed.
- To discuss construction and environmental mitigation.



Please sign in at the front desk and provide your input on the Project by completing a questionnaire.

Commitment to Consultation

We are committed to a comprehensive consultation process and want to hear from you about this Project.

Our consultation approach is:

Inclusive – reaching out to all who may be interested or affected and providing opportunities to become informed and get involved.

Transparent – providing access to information and clear explanations for decisions.

Accountable – explaining how your input will be used in the decision-making process.

As an important part of the consultation process, we will work with all stakeholders to identify and resolve potential Project-related issues.



Enbridge's Indigenous Peoples Policy

Enbridge recognizes the diversity of Indigenous Peoples who live where we work and operate. We understand that the history of Indigenous Peoples in both Canada and the United States has had destructive impacts on the social and economic wellbeing of Indigenous Peoples. Enbridge recognizes the importance of reconciliation between Indigenous communities and broader society. Positive relationships with Indigenous Peoples, based on mutual respect and focused on achieving common goals, will create constructive outcomes for Indigenous communities and for Enbridge.

Enbridge commits to pursuing sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge conducts business. To achieve this, Enbridge will govern itself by the following principles:

- We recognize the legal and constitutional rights possessed by Indigenous Peoples in Canada and in the U.S., and the importance of the relationship between Indigenous Peoples and their traditional lands and resources. We commit to working with Indigenous communities in a manner that recognizes and respects those legal and constitutional rights and the traditional lands and resources to which they apply, and we commit to ensuring that our projects and operations are carried out in an environmentally responsible manner.
- We recognize the importance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) within the context of existing Canadian and U.S. law and the commitments that governments in both countries have made to protecting the rights of Indigenous Peoples.
- We engage in forthright and sincere consultation with Indigenous Peoples about Enbridge's projects and operations through processes that seek to achieve early and meaningful engagement so their input can help define our projects that may occur on lands traditionally used by Indigenous Peoples.
- We commit to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge's projects and operations, including opportunities in training and education, employment, procurement, business development, and community development.
- We foster understanding of the history and culture of Indigenous Peoples among Enbridge's employees and contractors, in order to create better relationships between Enbridge and Indigenous communities.

This commitment is a shared responsibility involving Enbridge and its affiliates, employees and contractors, and we will conduct business in a manner that reflects the above principles. Enbridge will provide ongoing leadership and resources to ensure the effective implementation of the above principles, including the development of implementation strategies and specific action plans.

Enbridge commits to periodically reviewing this policy to ensure it remains relevant and meets changing expectations.

Project Introduction

What is being proposed?

- Installation of approximately 20 km of natural gas pipeline to replace an existing extra high pressure (XHP) steel natural gas pipeline (i.e., the “St. Laurent Pipeline”).
- The project under consideration represents Phases 3 and 4 of a four-phase plan for replacing the existing St. Laurent Pipeline. Phase 1 has been completed and Phase 2 is currently under construction.
- Phase 3 involves the installation of new

intermediate pressure (IP) plastic gas mains in order to continue to service customers with natural gas, since the proposed replacement pipeline route deviates from the existing pipeline route.

- Phase 4 involves installation of new nominal pipe size (NPS) 12-inch and NPS 6-inch XHP steel pipe to replace the existing St. Laurent Pipeline.

Why do we need this project?

- The existing pipeline requires replacement due to its age and condition.



Project Location

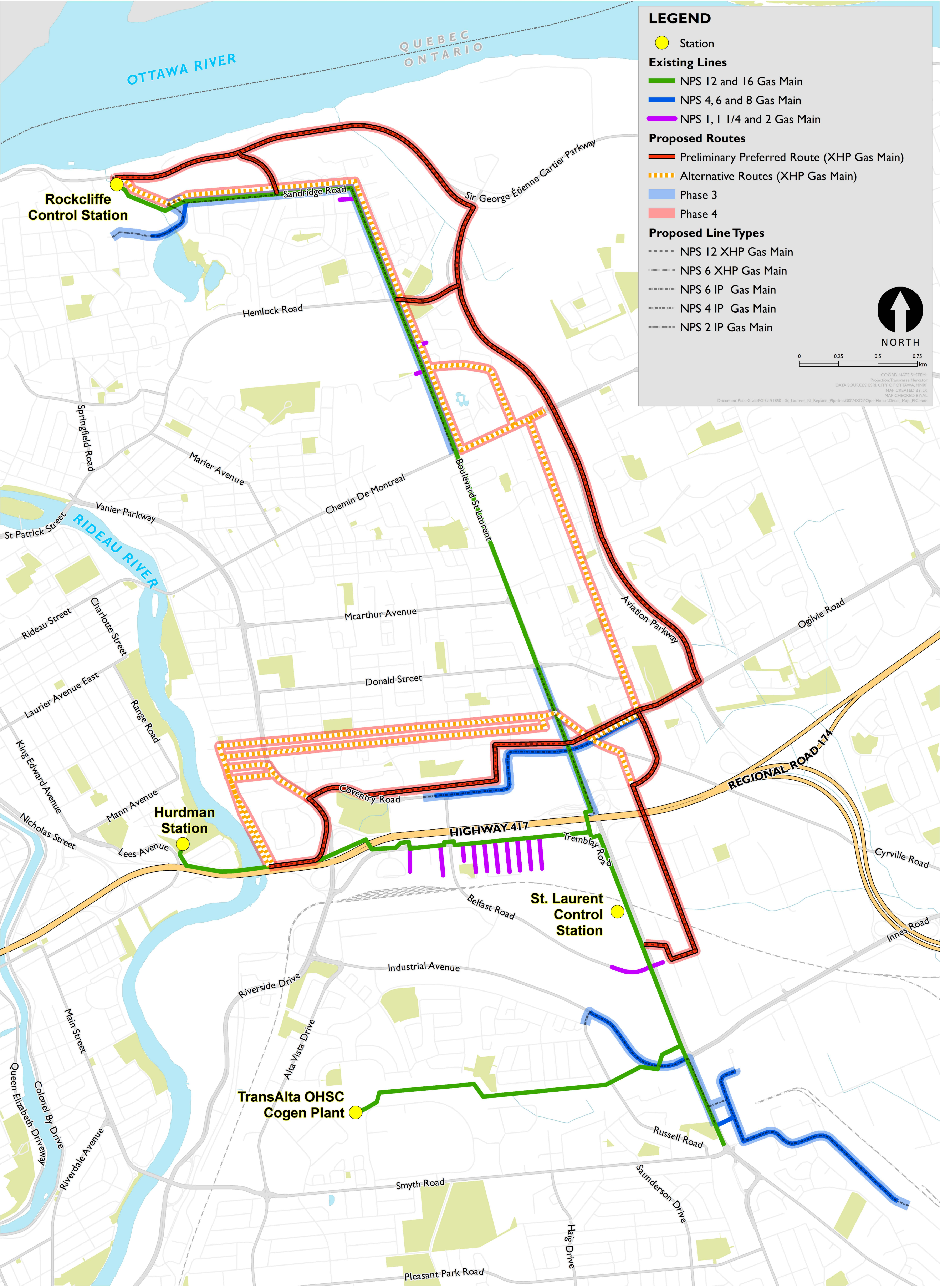
The proposed Project will replace approximately 13 km of the existing St. Laurent Pipeline that is currently located along St. Laurent Boulevard in Vanier and Ottawa South.

Enbridge has identified the preferred routes for the proposed IP plastic mains, which consist of NPS 2-inch, NPS 4-inch, and NPS 6-inch pipeline segments. There are no alternatives for these lines, as they need to be installed within the existing road infrastructure in the area in order to continue to provide service to existing customers.

Enbridge has identified a preliminary preferred route for the proposed NPS 12-inch and NPS 6-inch XHP steel gas mains, as well as several alternative routes/route combinations. The pipeline would be installed within the municipal road rights-of-way, where possible.



See the large table map for route details.



LEGEND

- Station
- Existing Lines**
 - NPS 12 and 16 Gas Main
 - NPS 4, 6 and 8 Gas Main
 - NPS 1, 1 1/4 and 2 Gas Main
- Proposed Routes**
 - Preliminary Preferred Route (XHP Gas Main)
 - Alternative Routes (XHP Gas Main)
 - Phase 3
 - Phase 4
- Proposed Line Types**
 - NPS 12 XHP Gas Main
 - NPS 6 XHP Gas Main
 - NPS 6 IP Gas Main
 - NPS 4 IP Gas Main
 - NPS 2 IP Gas Main

0 0.25 0.5 0.75 km

COORDINATE SYSTEM: Projective Transverse Mercator
 DATA SOURCES: ESRI, CITY OF OTTAWA, MNR
 MAP CREATED BY: LK
 MAP CHECKED BY: AL
 Document Path: G:\GIS\191850 - St. Laurent_N_Replace_Pipeline\GIS\MXD\OpenHouse\Detail_Map_PC.mxd



Baseline Studies – Desktop and Field

Desktop and Field Studies Completed:

- Vegetation survey
- Identification of watercourses and wetlands
- Identification of Species at Risk (SAR) habitat
- Incidental wildlife observations
- Archaeology and built heritage

Standard mitigation strategies will be carried out throughout construction in an effort to avoid potential impacts to native vegetation, aquatic resources, wetlands, urban wildlife, SAR, and archaeological features.



Pipeline Design, Construction, and Safety

Pipeline Design

The proposed pipeline is designed to meet and/or exceed the regulations of the Canadian Standards Association (Z662 Oil and Gas Pipeline Systems) and the applicable regulations of the Technical Standards & Safety Association (TSSA).

Pipeline Construction

Our construction work is temporary and transitory – once the pipe is laid, we restore the area to as close to pre-construction condition as possible.

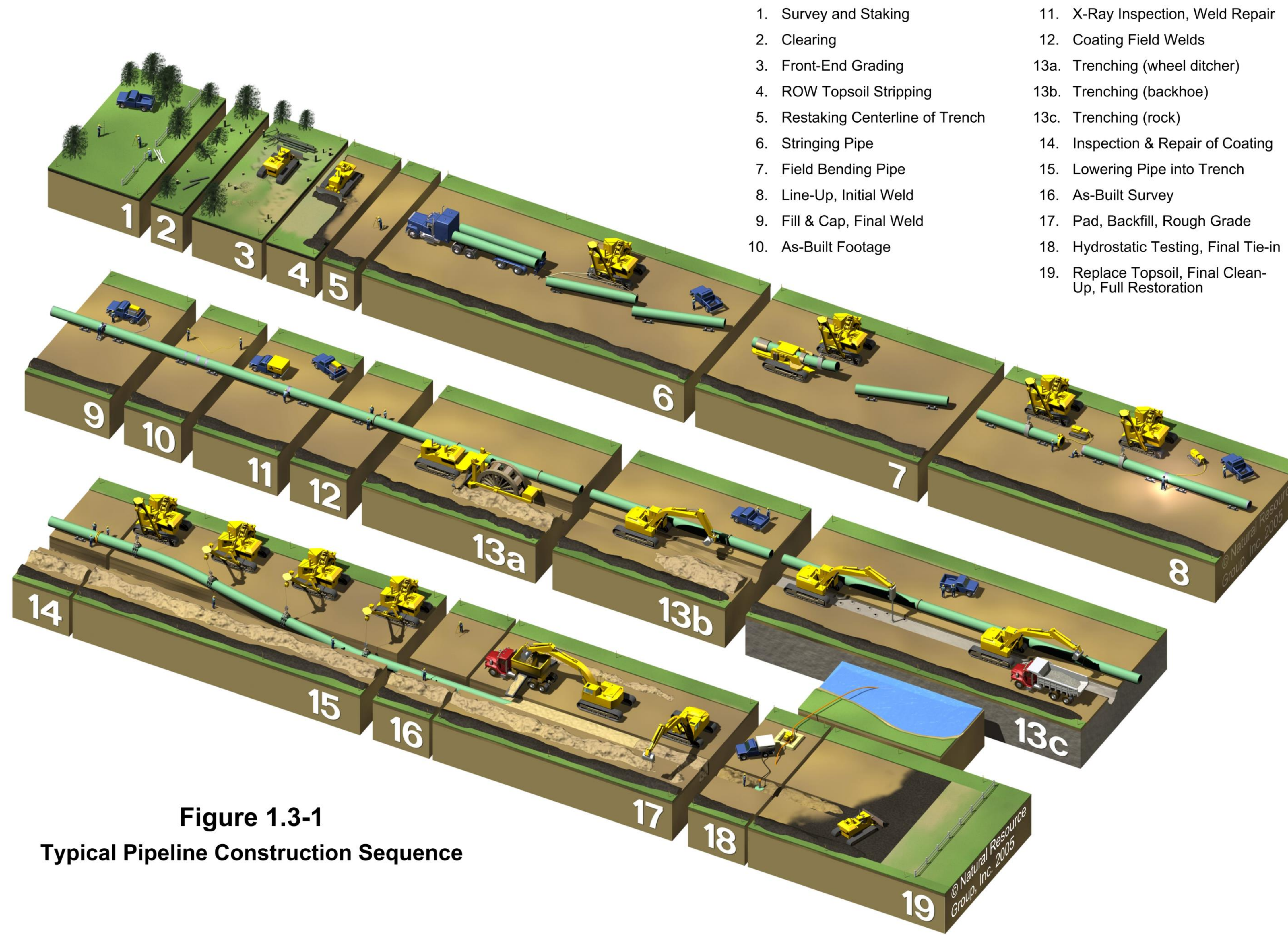
Pipeline Safety and Integrity

We take many steps to safely and reliably operate our network of natural gas pipelines, such as:

- Designing, constructing, and testing our pipelines to meet or exceed requirements set by industry standards and regulatory authorities.
- Ensuring that any work is respectful of community activities, regulations and bylaws.
- Continuously monitoring the entire network.
- Performing regular field surveys to detect leaks and confirm corrosion prevention methods are working as intended.



Pipeline Construction Sequence



1. Survey and Staking
2. Clearing
3. Front-End Grading
4. ROW Topsoil Stripping
5. Restaking Centerline of Trench
6. Stringing Pipe
7. Field Bending Pipe
8. Line-Up, Initial Weld
9. Fill & Cap, Final Weld
10. As-Built Footage
11. X-Ray Inspection, Weld Repair
12. Coating Field Welds
- 13a. Trenching (wheel ditcher)
- 13b. Trenching (backhoe)
- 13c. Trenching (rock)
14. Inspection & Repair of Coating
15. Lowering Pipe into Trench
16. As-Built Survey
17. Pad, Backfill, Rough Grade
18. Hydrostatic Testing, Final Tie-in
19. Replace Topsoil, Final Clean-Up, Full Restoration

Figure 1.3-1
Typical Pipeline Construction Sequence

Used By Permission Natural Resource Group, Inc. © 2010

Mitigation and Monitoring

We are committed to working with the community on construction planning, mitigation, and post-construction monitoring. Enbridge will conduct post-construction monitoring so that impacted areas are restored to as close to pre-construction conditions as possible.



Enbridge recognizes that the construction of the pipeline may result in short-term adverse impacts and commits to applying mitigation measures to reduce these impacts and work with the City and local residents so that issues are resolved in a timely manner.

Regulatory Framework

For the Project to proceed, approval from the Ontario Energy Board (OEB) is required. The OEB requires that Enbridge complete an environmental assessment and route selection study.

Role of the Ontario Energy Board:

- Reviews the Environmental Report (including details of consultation) as part of the application, known as the Leave-to-Construct Application.
- Once the Leave-to-Construct Application is submitted to the OEB, any party with an interest in the project may apply to the OEB to become intervenors or interested parties.
- Provides a public forum during the review of the Leave-to-Construct Application for people to participate in the decision-making process.
- Determines whether a proposed pipeline is in the public interest.



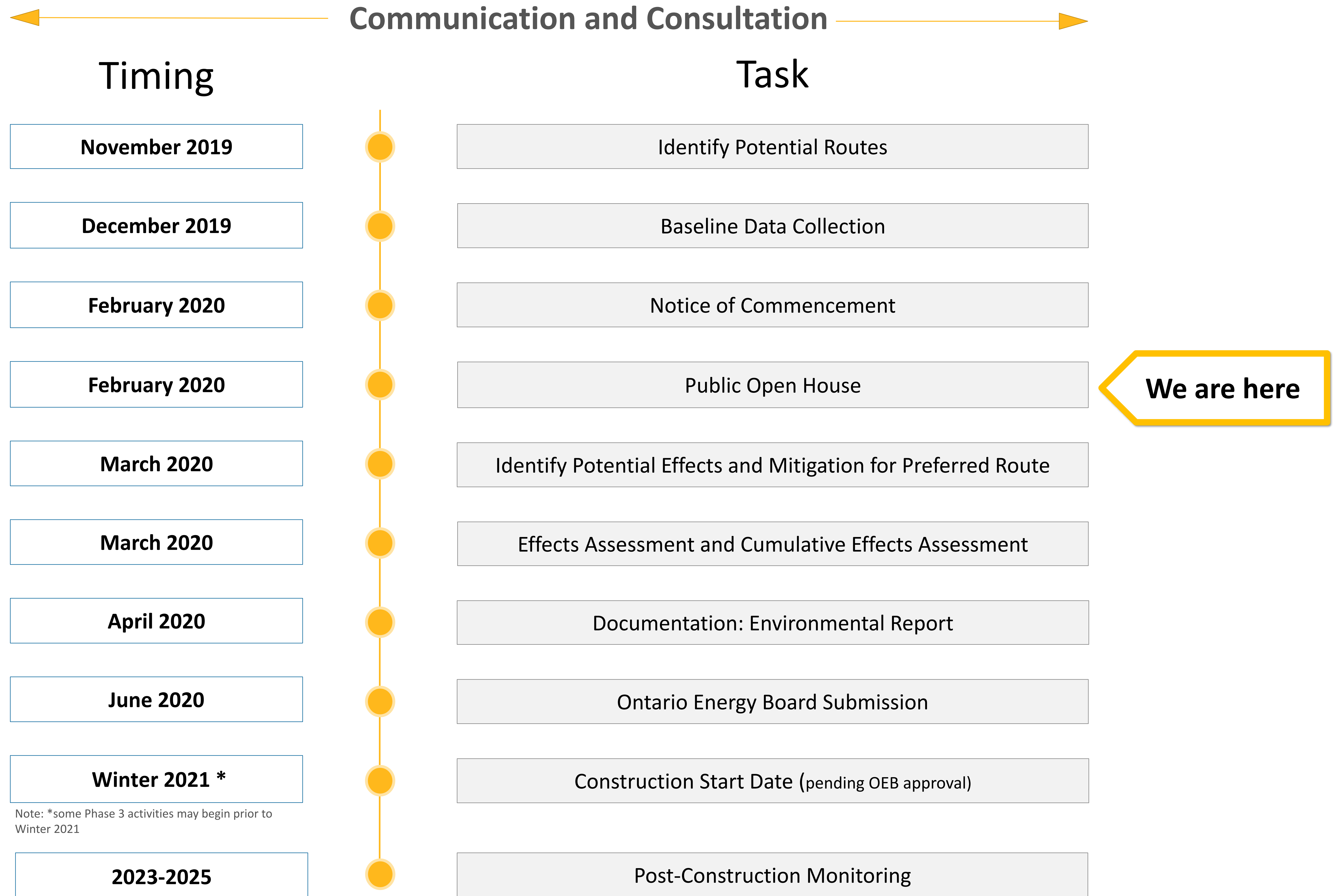
Continuous Stakeholder Engagement

Enbridge is committed to open dialogue throughout the environmental assessment and the OEB Leave-to-Construct Application process. Stakeholders will have the opportunity to remain engaged in the process after the environmental assessment is completed, through:

- Participation in the OEB hearing as an intervenor or interested party (details can be found at www.ontarioenergyboard.ca)
- Contacting Enbridge or Dillon Project team members
- Visiting our Project page at www.enbridgegas.com/about-us and clicking on the **Projects** tab!



Environmental Assessment Process and Project Schedule



Note: *some Phase 3 activities may begin prior to Winter 2021

Public Open House

Staying Informed

Get Project updates by providing us with your email or mailing address.

Please ensure you've signed in! **Complete the comment form** and drop it in the box at the door or give it to one of our Project Team Members.

For comments, questions or for more information, please contact:

Tanya Turk

Environmental Advisor
Enbridge Gas Inc.

416-495-3103

Tanya.Turk@enbridge.com

101 Honda Boulevard
Markham, ON L6C 0M6

Tristan Lefler

Environmental Assessment Project Manager
Dillon Consulting Limited

519-571-9833

StLaurentNorthEA@dillon.ca

51 Breithaupt Street, Suite 200
Kitchener, ON N2H 5G5

Under the *Freedom of Information and Protection of Privacy Act*, all comments and questions submitted regarding this Project will be used for the purposes of creating an environmental assessment report that will be a part of the public record and will be made available to individuals or organizations with an interest in this Project. Personal information such as name, address, and telephone number will not be included in the environmental assessment report but will be released, if requested, to any person as part of the review of the environmental assessment report.

Projet proposé de remplacement du pipeline Saint-Laurent Ottawa Nord



**Bienvenue à notre rencontre
de type portes ouvertes**

Accueil

Qui sommes-nous?

Enbridge Gas Inc. (Enbridge) offre une distribution sécuritaire et fiable de gaz naturel à plus de 3,7 millions de clients résidentiels, commerciaux et industriels, partout en Ontario, au Québec et au Nouveau-Brunswick. Enbridge s'engage à une saine gestion de l'environnement et mène toutes ses opérations d'une manière responsable et respectueuse de l'environnement.

Pourquoi sommes-nous ici?

- Afin de fournir de l'information sur le projet proposé de remplacement du pipeline Saint-Laurent Ottawa Nord et de présenter les tracés éventuels.
- Afin d'offrir aux propriétaires touchés et au public l'occasion de discuter du projet proposé avec Enbridge et Dillon.
- Afin de connaître l'avis des propriétaires touchés et celui du grand public sur toute question à régler.
- Afin de discuter des mesures d'atténuation des impacts sur l'environnement et durant la construction.



Veillez vous inscrire à la réception et donner votre avis sur le projet en remplissant un questionnaire.

Engagement à consulter

Nous nous engageons à un processus exhaustif de consultation et nous souhaitons connaître votre opinion à propos de ce projet.

Notre approche en matière de consultation est:

Inclusive – atteindre tous ceux qui peuvent être intéressés ou touchés par le projet et leur fournir des occasions de demeurer informés et de s’impliquer dans ledit projet.

Transparente – offrir un accès à l’information et des explications claires menant à des prises de décisions éclairées.

Fiable – expliquer la façon dont votre opinion sera utilisée lors du processus de prises de décisions.

Une partie importante du processus de consultation consistera à travailler en étroite collaboration avec toutes les personnes concernées pour cerner et résoudre d’éventuels problèmes liés au projet.



Politique d'Enbridge à l'égard des peuples autochtones

Enbridge reconnaît la diversité des peuples autochtones qui vivent dans les endroits où elle travaille et fonctionne. Nous comprenons que par le passé, les peuples autochtones du Canada et des États-Unis ont subi certaines répercussions nocives pour leur bien-être social et économique. Enbridge reconnaît l'importance de la réconciliation entre les communautés autochtones et la société au sens large. Des relations positives avec les peuples autochtones, fondées sur un respect mutuel et axées sur l'atteinte de buts communs, donneront des résultats constructifs pour les communautés autochtones et pour Enbridge.

Enbridge s'engage à maintenir des relations durables avec les nations autochtones et les groupes habitant à proximité des lieux où elle exerce ses activités. Afin d'atteindre cet objectif, Enbridge se conformera aux principes suivants :

- Nous reconnaissons les droits légaux et constitutionnels de peuples autochtones du Canada et des États-Unis, ainsi que l'importance de la relation entre les peuples autochtones, leurs terres et leurs ressources ancestrales. Nous nous engageons à travailler avec les communautés autochtones d'une manière qui reconnaît et respecte ces droits légaux et constitutionnels, ainsi que les terres et ressources ancestrales auxquelles ils s'appliquent, et nous nous engageons à nous assurer que nos projets et nos opérations sont exécutés de manière responsable sur le plan écologique.
- Nous reconnaissons l'importance de la Déclaration des Nations Unies sur les droits des peuples autochtones (DNUDPA), dans le contexte de la loi actuelle du Canada et des États-Unis, ainsi que les engagements pris par les gouvernements des deux pays pour protéger les droits des peuples autochtones.
- Nous nous engageons à tenir des consultations franches et honnêtes auprès des peuples autochtones à propos des projets et des opérations d'Enbridge, au moyen de processus qui tentent de réaliser un engagement rapide et significatif, de façon à ce que leur opinion puisse contribuer à définir nos projets éventuels sur les terres ancestrales des peuples indigènes.
- Nous nous engageons à travailler en collaboration avec les peuples autochtones afin qu'ils tirent profit des projets et des opérations d'Enbridge, y compris des occasions de formation et d'éducation, de l'emploi, de l'approvisionnement, du développement d'affaires et du développement communautaire.
- Nous favorisons la compréhension de l'histoire et de la culture des peuples autochtones chez les employés et les entrepreneurs d'Enbridge afin d'établir de meilleures relations entre Enbridge et les communautés autochtones.

Cet engagement constitue une responsabilité que partage Enbridge avec ses filiales, ses employés et ses entrepreneurs; elle mènera donc ses activités de manière à refléter le respect des principes énumérés ci-dessus. Enbridge fournira le leadership continu et les ressources pour assurer la mise en place efficace de ces principes, y compris le développement de stratégies de mise en œuvre et des plans d'action précis.

Enbridge s'engage à revoir cette politique périodiquement afin de s'assurer qu'elle demeure pertinente et qu'elle répond aux attentes en évolution constante.

Présentation du projet

En quoi consiste le projet proposé?

- Installation d'un pipeline de gaz naturel d'environ 20 km pour remplacer une canalisation actuelle de gaz naturel à pression ultra élevée, c'est-à-dire le « pipeline Saint-Laurent ».
- Le projet envisagé constitue les Phases 3 et 4 d'un plan à quatre phases pour remplacer le pipeline Saint-Laurent actuel. La Phase 1 a été parachevée et la Phase 2 est en cours de construction.
- La Phase 3 comprend l'installation de nouvelles conduites à gaz à pression intermédiaire afin de

continuer à servir les clients en gaz naturel, puisque le tracé du pipeline de remplacement proposé dévie du tracé actuel.

- La Phase 4 comprend l'installation d'un nouveau diamètre nominal de la conduite (NPS) de 12 pouces et d'un nouveau NPS de 6 pouces pour remplacer le pipeline Saint-Laurent actuel.

Pourquoi ce projet s'avère-t-il nécessaire?

- Le pipeline actuel doit être remplacé, à cause de son âge et de sa vétusté.



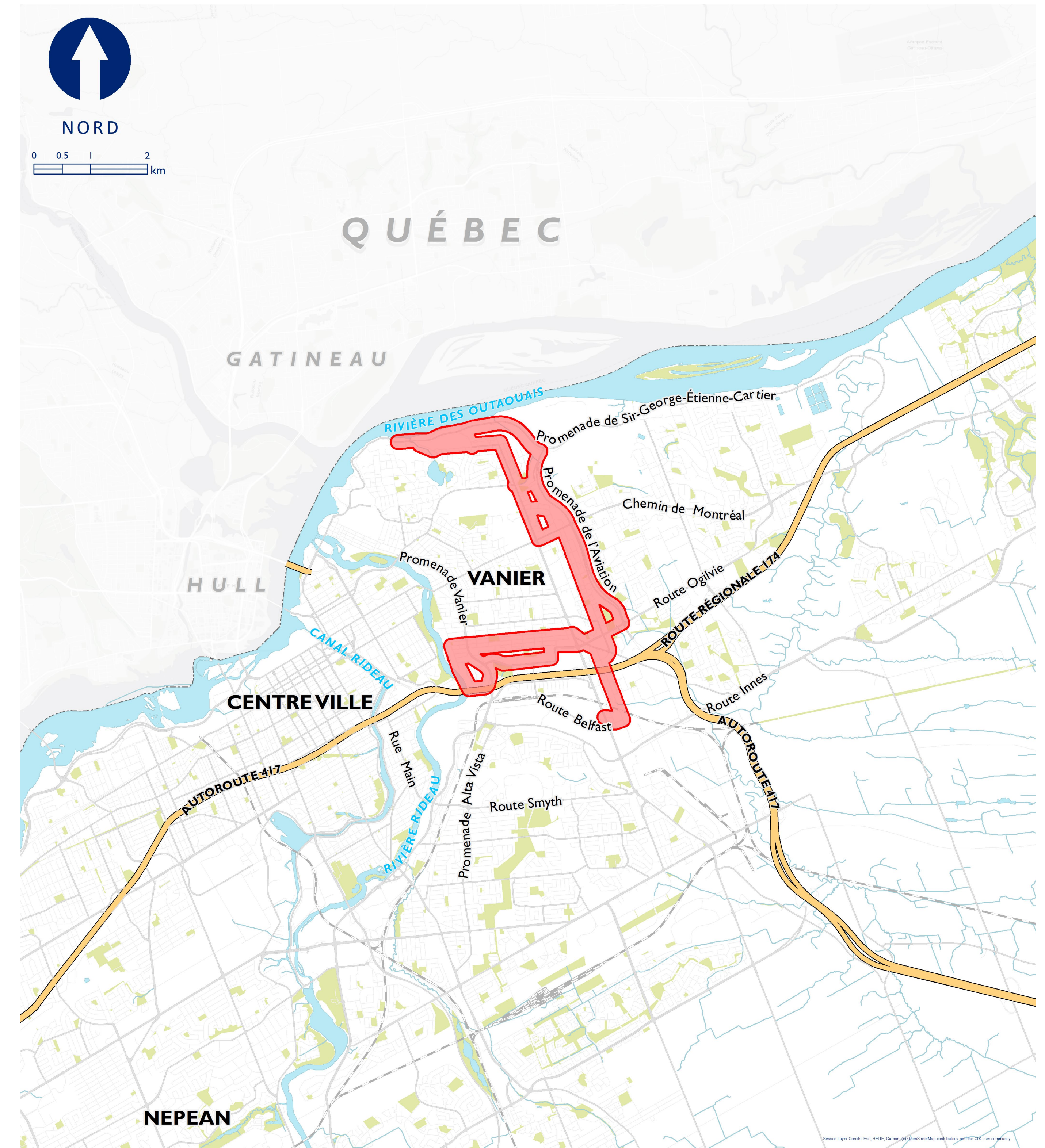
Emplacement du projet

Le projet proposé vise à remplacer environ 13 km du pipeline Saint-Laurent actuel qui longe le boulevard Saint-Laurent dans Vanier et Ottawa Sud.

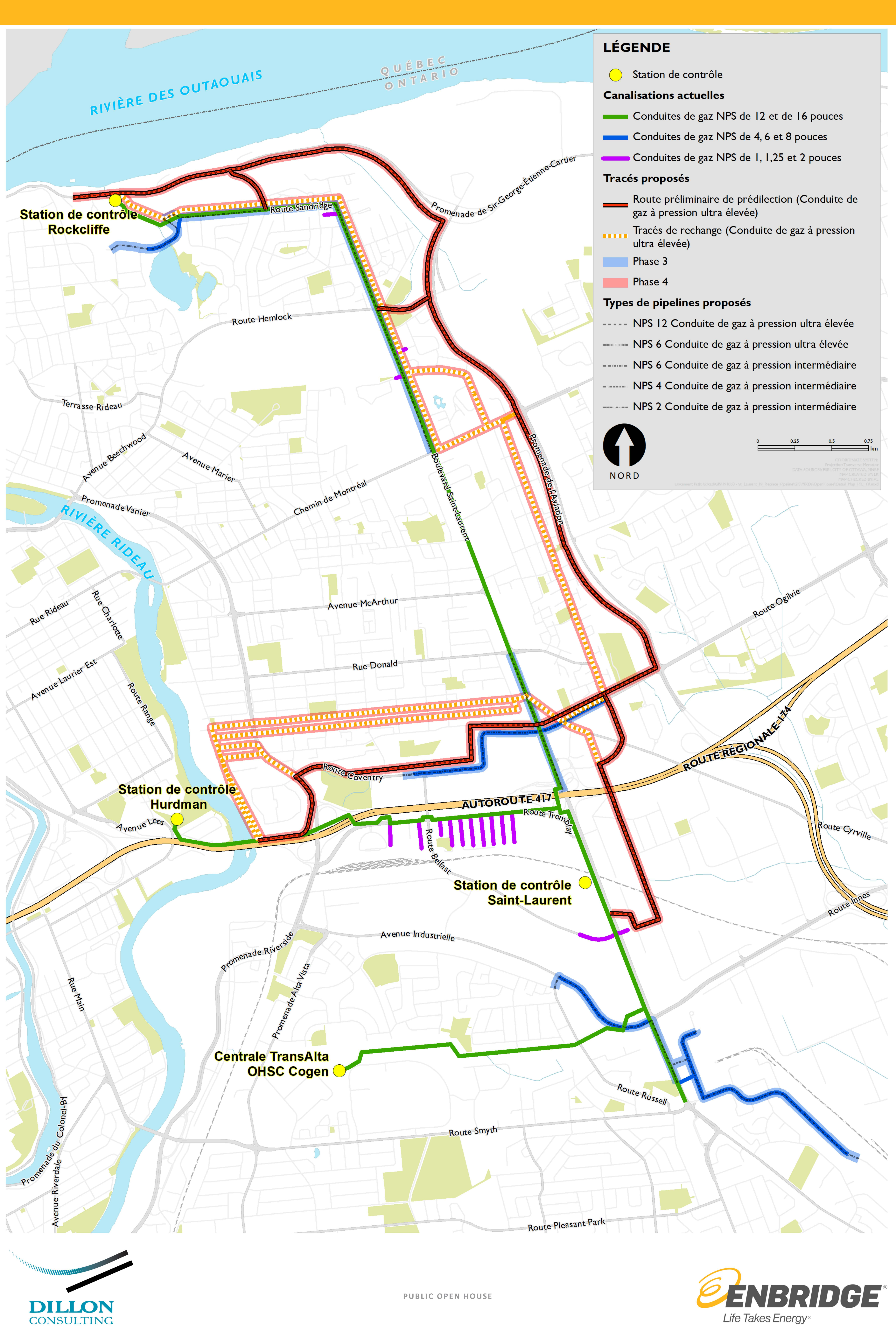
Enbridge a repéré des tracés de prédilection pour les conduites de plastique proposées, qui sont des segments de pipeline NPS de 2 pouces, 4 pouces et 6 pouces. Il n'y a pas de solution de rechange pour ces lignes, étant donné qu'elles doivent être installées dans le secteur afin de continuer d'approvisionner les clients actuels en gaz naturel.

Enbridge a déterminé un tracé préliminaire de prédilection pour les conduites de gaz en acier de NPS de 12 pouces et de 6 pouces ainsi que plusieurs tracés de rechange/combinaisons de tracés.

Dans la mesure du possible, le pipeline devrait être installé au sein de l'emprise des routes municipales.



Reportez-vous à la carte agrandie pour plus de détails sur le tracé.



LÉGENDE

● Station de contrôle

Canalisations actuelles

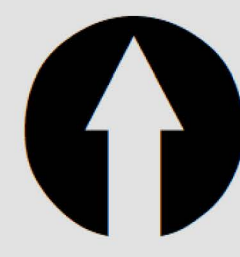
- Conduites de gaz NPS de 12 et de 16 pouces
- Conduites de gaz NPS de 4, 6 et 8 pouces
- Conduites de gaz NPS de 1, 1,25 et 2 pouces

Tracés proposés

- Route préliminaire de prédilection (Conduite de gaz à pression ultra élevée)
- Tracés de rechange (Conduite de gaz à pression ultra élevée)
- Phase 3
- Phase 4

Types de pipelines proposés

- NPS 12 Conduite de gaz à pression ultra élevée
- NPS 6 Conduite de gaz à pression ultra élevée
- NPS 6 Conduite de gaz à pression intermédiaire
- NPS 4 Conduite de gaz à pression intermédiaire
- NPS 2 Conduite de gaz à pression intermédiaire



COORDONATE SYSTEM: Project: TransAlta - Ottawa
 DATA SOURCES: ENR, CITY OF OTTAWA, PHR
 MAP CREATED BY: ENR
 PWP CHECKED BY: ENR
 Document Path: G:\GIS\11800 - St-Laurent, N_Replace_Pipeline\GIS\11800\OpenHouse\Detail_Map_PC_Full.mxd

Études préliminaires théoriques et sur le terrain

Études théoriques et sur le terrain parachevées :

- Étude de la végétation
- Repérage des cours d'eau et des terres humides
- Repérage de l'habitat des espèces en péril
- Observations secondaires de la faune
- Archéologie et patrimoine bâti

Des stratégies d'atténuation standards seront mises en place pendant la construction afin d'éviter des répercussions potentielles sur la végétation indigène, les ressources aquatiques, les terres humides, la faune urbaine, les espèces en péril et les caractéristiques archéologiques.



Conception, construction et sécurité du pipeline

Conception du pipeline

Le pipeline proposé est conçu pour répondre et (ou) surpasser les réglementations de l'Association canadienne de normalisation (norme Z662, réseaux de canalisations de pétrole et de gaz) et les réglementations applicables de la Technical Standards & Safety Association (TSSA).

Construction du pipeline

Nos travaux de construction sont temporaires et transitoires. Une fois la canalisation installée, dans la mesure du possible, nous remettons le secteur dans l'état où il se trouvait avant la construction.

Sécurité et intégrité du pipeline

Nous prenons de nombreuses mesures pour exploiter notre réseau de canalisations de gaz naturel de façon sécuritaire et fiable en:

- concevant, construisant et mettant à l'essai nos pipelines afin de nous assurer qu'ils respectent ou surpassent les exigences définies par les normes de l'industrie et les autorités réglementaires;
- s'assurant que tous les travaux s'effectuent dans le respect des activités de la collectivité, des réglementations et des règlements administratifs;
- exerçant une surveillance continue sur la totalité du réseau;
- effectuant des analyses périodiques sur le terrain afin de détecter des fuites éventuelles et de nous assurer que les méthodes de prévention de la corrosion fonctionnent comme prévu.

1



2



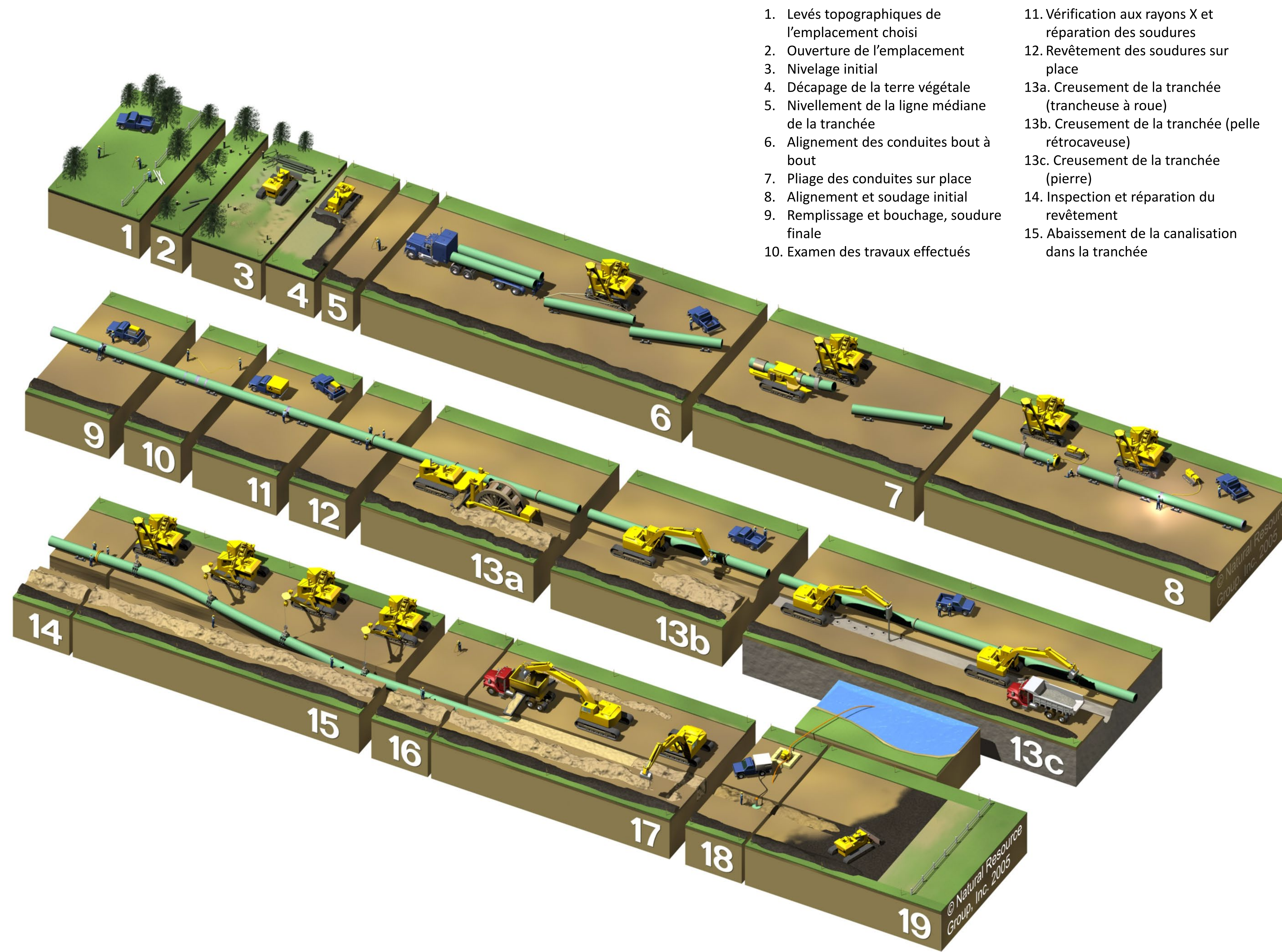
3



4



Étapes de la construction d'un pipeline



Atténuation et surveillance

Nous nous engageons à travailler en collaboration avec la communauté sur la planification de la construction, l'atténuation des impacts et la surveillance post-construction. Enbridge effectuera une surveillance post-construction, de façon à ce que les zones touchées soient remises, dans la mesure du possible, dans l'état où elles se trouvaient avant la construction.



Enbridge reconnaît que la construction du pipeline pourrait avoir des impacts négatifs à court terme; elle s'engage donc à mettre en place des mesures d'atténuation pour réduire ces impacts et à travailler avec la Ville et ses résidents afin que les problèmes soient résolus dans un délai convenable.

Cadre réglementaire

L'approbation de la Commission de l'énergie de l'Ontario est requise pour que le projet aille de l'avant. À cette fin, la commission exige qu'Enbridge procède à une évaluation environnementale et à une étude de choix de tracé.

Rôle de la Commission de l'énergie de l'Ontario:

- Examine le rapport environnemental (y compris les détails de la consultation) comme partie intégrante de la candidature, connue sous le nom de demande d'autorisation de construire.
- Une fois la demande d'autorisation de construire soumise à la Commission de l'énergie de l'Ontario, toute partie intéressée par le projet peut soumettre sa candidature pour devenir intervenante ou partie concernée.
- Fournit une tribune publique durant l'examen de la demande d'autorisation de construire afin que les gens puissent participer au processus de prise de décisions.
- Détermine si la construction d'un pipeline donné est dans l'intérêt public ou non.



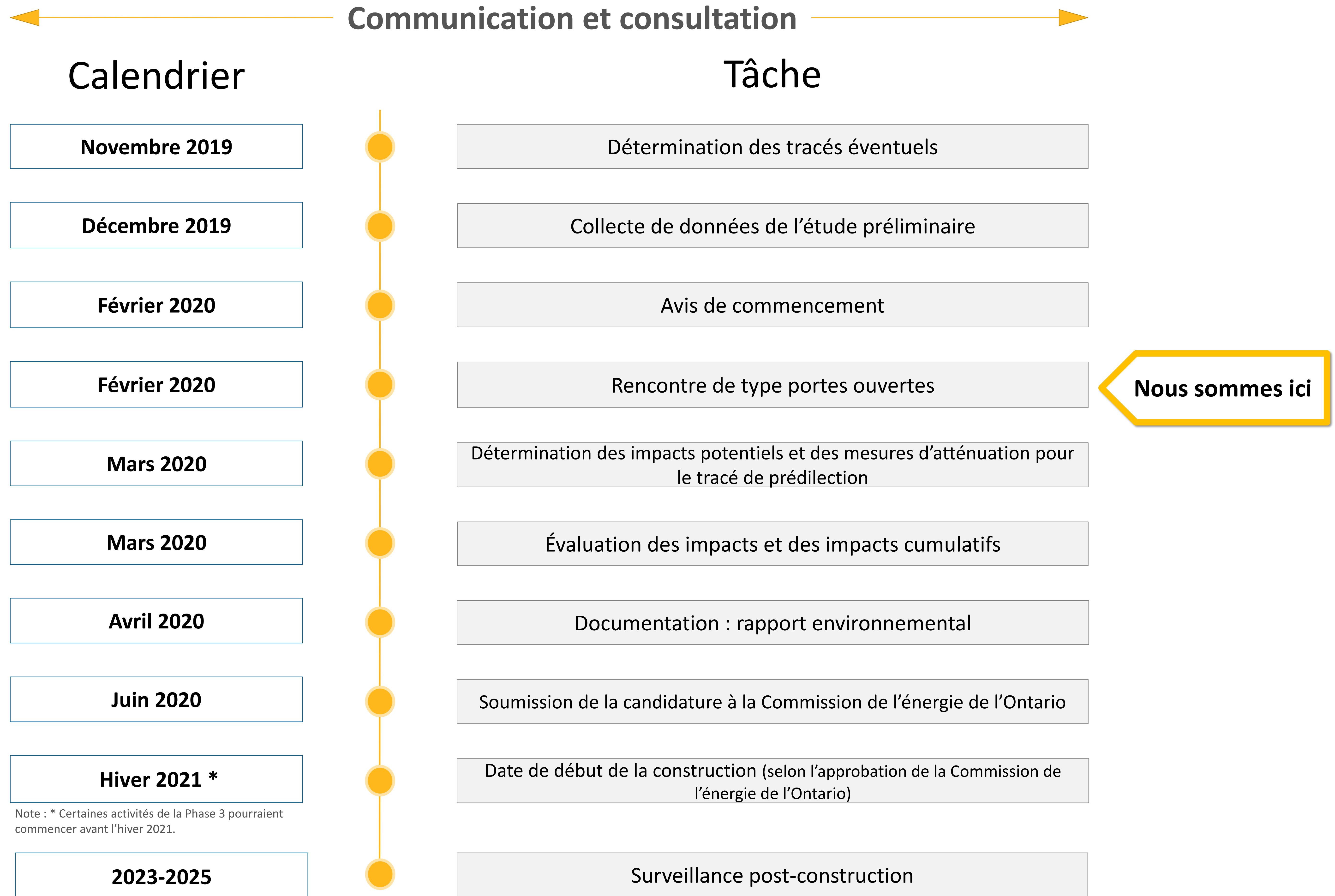
Engagement continu des intervenants

Enbridge s'engage à maintenir le dialogue ouvert tout au long de l'évaluation environnementale et du processus de demande d'autorisation de construire auprès de la Commission de l'énergie de l'Ontario. Les intervenants auront l'occasion de demeurer impliqués dans le processus, une fois l'évaluation environnementale terminée, en:

- Participant à l'audience de la Commission de l'énergie de l'Ontario à titre d'intervenant ou de partie concernée (pour plus de détails, visitez : www.oeb.ca/fr)
- Communiquant avec Enbridge ou des membres de l'équipe de projet de Dillon
- Visitant la page de notre projet à : www.fr.enbridge.com/a-propos et en cliquant sur l'onglet **Projets**



Processus d'évaluation environnementale et échéancier du projet



Note : * Certaines activités de la Phase 3 pourraient commencer avant l'hiver 2021.

Rencontre de type portes ouvertes

Restez informé(e)!

Obtenez de l'information mise à jour sur le projet en nous fournissant votre courriel ou votre adresse postale.

Assurez-vous d'être bien inscrit! **Remplissez le questionnaire**, déposez-le dans la boîte prévue à cette fin à la porte ou remettez-le à l'un des membres de l'équipe de projet.

Pour tout commentaire, question ou renseignements additionnels, veuillez contacter:

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Conformément à la *Loi sur l'accès à l'information et à la protection de la vie privée*, tout commentaire et question soumis en ce qui a trait à ce projet sera utilisé dans le but de créer un rapport d'évaluation environnementale qui fera partie d'un registre public et qui sera mis à la disposition de personnes ou d'organismes intéressés par ce projet. **Les renseignements personnels comme le nom, l'adresse et le numéro de téléphone n'apparaîtront pas dans le rapport d'évaluation environnementale**, mais ils seront diffusés, si nécessaire, à toute personne qui en fera la demande dans le cadre de l'examen du rapport d'évaluation environnementale.

Appendix J

Indigenous Consultation Logs

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



Indigenous Community Correspondence

Line Item	Date of Engagement	Name of Community and Contact	Description of Engagement Activity	Date of Response	Response and Issue Resolution (if applicable)
1.1	February 5, 2020	Algonquins of Ontario (AOO) Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative sent Project letter and Notice of Commencement via email and invited AOO to provide feedback. Enbridge representative also attached the Stage 1 Archaeological Assessment for review.	Not Applicable (N/A)	N/A
1.2	February 20, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative sent an email with an updated Project schedule to allow for more realistic review timeframes for the AOO. Enbridge representative also requested feedback on potential availability of Indigenous monitors for upcoming Stage 2 archaeological fieldwork anticipated to occur in May 2020.	N/A	N/A
1.3	March 10, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative sent AOO representatives an update on the Project and archaeological assessments. Enbridge representative provided details on potential timing of Stage 2 field work, as well as upcoming natural environment surveys, and asked AOO representatives if they had any interest in sending environmental monitors to participate in the field work.	N/A	N/A
1.4	March 30, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative followed-up on March 10 email, informing AOO representatives that the dates of the first spring field surveys were quickly approaching (first and second week of April) and requested that AOO indicate whether they had any interest in participating so that appropriate plans could be put in place to accommodate their participation.	N/A	N/A
1.5	March 30, 2020	AOO Contact: Sarah Cronier	Enbridge representative sent an email requesting an update on AOO workflow and the timeline for review of the Stage 1 Archaeological Assessment provided to AOO on February 5. Enbridge representative also stated that they would appreciate any information on how AOO is operating since the COVID-19 social distancing requirements have been implemented.	March 30, 2020	AOO representative responded that all employees were currently working from home and apologized for delays in responding to emails. AOO representative stated they would have to look into the status of the Stage 1 Archaeological Assessment review and get back to Enbridge on timing. AOO representative asked a question about invoicing.

Line Item	Date of Engagement	Name of Community and Contact	Description of Engagement Activity	Date of Response	Response and Issue Resolution (if applicable)
1.6	March 30, 2020	AOO Contact: Sarah Cronier	Enbridge representative thanked AOO representative for their response and answered questions about invoicing. Enbridge representative stated that there would be an update on the field schedule for the Project to be sent in a separate email later in the day.	N/A	N/A
1.7	April 2, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative informed AOO representatives that, due to improper weather conditions, Western Chorus Frog surveys were being postponed until the following week and requested that AOO advise whether they are interested in participating.	N/A	N/A
1.8	April 13, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative informed AOO representatives of the date for the final Western Chorus Frog surveys and requested that AOO advise whether they are interested in participating.	N/A	N/A
1.9	April 21, 2020	AOO Contact: Sarah Cronier	Enbridge representative inquired whether AOO representative could provide an update on the status of AOO's review of the Stage 1 Archaeological Assessment.	N/A	N/A
1.10	May 4, 2020	AOO Contacts: Janet Stavinga and Sarah Cronier	Enbridge representative provided an update on the status of the field surveys for the Project, indicating that the Western Chorus Frog surveys are complete and that two field surveys are remaining. Enbridge representative provided tentative schedule for the remaining field surveys and requested that AOO indicate whether they are interested in participating.	N/A	N/A
1.11	May 15, 2020	AOO Contact: Sarah Cronier	AOO representative thanked Enbridge representative for their email of May 14, 2020 and stated they would be available for a call on Wednesday the following week. AOO representative requested a map showing all the St. Laurent Pipeline project phases, stating that they would like to provide comments on it as part of their forthcoming response to the Stage 1 Archaeological Assessment for the Project.	May 15, 2020	Enbridge representative thanked AOO representative and suggested two potential meeting times for the following Wednesday. Enbridge representative stated they would be able to provide more detailed mapping of Phases 3 and 4 of the St. Laurent Pipeline Project next Tuesday, after the long weekend.

Line Item	Date of Engagement	Name of Community and Contact	Description of Engagement Activity	Date of Response	Response and Issue Resolution (if applicable)
1.12	May 21, 2020	AOO Contact: Sarah Cronier	<p>Enbridge representative emailed AOO representative apologizing for not being able to connect the previous day and inquired if the AOO representative would be available for a call the following week.</p> <p>Enbridge representative provided a map of the different phases of the St. Laurent Project, noting that Phase 2 is currently under construction and is expected to be completed in summer 2020, and that Phases 3 and 4 are currently in the environmental review stage.</p> <p>Enbridge representative thanked AOO representative for their review of the Stage 1 Archaeological Assessment for the Project and stated that Enbridge is currently working to integrate AOO's comments and recommendations.</p>	N/A	N/A
1.13	June 3, 2020	AOO Contact: Sarah Cronier	<p>Enbridge representative provided letter outlining Enbridge's response to AOO's comments and recommendations on the Stage 1 Archaeological Assessment and noted that they would keep AOO informed of the timing of the Stage 2 fieldwork.</p> <p>Enbridge representative also provided anticipated dates of upcoming environmental surveys for the Project and asked that AOO indicate if they would be interested in having a community representative participate.</p>	June 8, 2020	<p>AOO representative acknowledged receipt of Enbridge's feedback on AOO's comments on the Stage 1 Archaeological Assessment and stated they are looking forward to receiving the revised copy of the Stage 1 report for final review before submission to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI).</p> <p>AOO representative noted that the AOO is generally interested in participating in environmental surveys, however, due to COVID-19 and current capacity, they are unable to participate in the upcoming field surveys for the Project. AOO representative asked that they be kept informed of future opportunities for participation as their capacity may grow/change and the COVID-19 situation evolves.</p>

Line Item	Date of Engagement	Name of Community and Contact	Description of Engagement Activity	Date of Response	Response and Issue Resolution (if applicable)
2.1	February 14, 2020	Mohawk Council of Akwesasne (MCA) Contact: Chief Abram Benedict	Enbridge representative sent Project letter and Notice of Commencement via email and invited MCA to provide feedback. Enbridge representative stated they would keep MCA apprised of any upcoming archaeological field studies and opportunities for MCA to participate.	N/A	N/A
2.2	June 2, 2020	MCA Contact: Chief Abram Benedict	Enbridge representative provided an update on the Project and noted that Stage 2 archaeological fieldwork is tentatively planned for July/August, but dependent on the COVID-19 restrictions that are in effect at that time.	N/A	N/A
2.3	June 3, 2020	MCA Contact: Chief Abram Benedict	Enbridge representative provided anticipated dates of upcoming environmental surveys for the Project and asked that MCA indicate if they would be interested in having a community representative participate.	N/A	N/A

Appendix K

Groundwater Well Records

Phase 3 IP Segment 1 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 3 IP Segment 1 to better understand local groundwater conditions. There were a total of 22 unique well IDs located within 100 m of the route, which includes two water supply wells, 15 observation wells, three records for well abandonment and two records where the current status is not available. **Table K1** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 26.2 mbgs and 5.5mbgs, with an average depth of approximately 11.9 mbgs. Records of static water levels range between 6.6 mbgs and 0 mbgs with an average static level of 5.3 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 26.2 mbgs to 2.1 mbgs, with an average “water found” depth of 12.0 mbgs. Bedrock was reported to be encountered between 6.7 mbgs and 1.8 mbgs with an average depth of 4.3 mbgs.

Table K1: Water Well Records within 100 m of Phase 3 IP Segment 1

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501133	72.5	0.0	N/A	26.2	1.8	26.2	Water Supply
1508880	68.3	6.4	61.9	24.4	6.7	20.7	Water Supply
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned-Supply
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7109370	68.2	6.0	62.2	N/A	N/A	N/A	Observation Well
7109370	68.3	6.6	61.7	N/A	N/A	N/A	Observation Well
7109370	68.5	5.9	62.6	N/A	N/A	N/A	Observation Well
7109370	68.2	5.7	62.5	N/A	N/A	N/A	Observation Well
7109370	68.4	5.8	62.6	N/A	N/A	N/A	Observation Well
7109370	68.4	5.9	62.5	N/A	N/A	N/A	Observation Well
7177893	72.1	N/A	N/A	N/A	N/A	N/A	N/A
7184918	68.3	N/A	N/A	8.1	N/A	N/A	Observation Well
7184919	68.5	N/A	N/A	7.3	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7199627	46.9	N/A	N/A	10.4	N/A	5.4	Observation Well
7210981	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210982	72.5	N/A	N/A	14.9	N/A	N/A	Observation Well
7210983	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210984	72.1	N/A	N/A	12.2	N/A	N/A	Observation Well
7225113	47.7	N/A	N/A	N/A	N/A	5.5	Abandoned-Supply
7225114	46.5	N/A	N/A	N/A	N/A	2.1	Abandoned-Supply
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A
7290015	69.2	N/A	N/A	7.6	N/A	N/A	Observation Well

Note: N/A indicates information not available in well record

Phase 3 IP Segment 2 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 3 IP Segment 2 to better understand local groundwater conditions. There were a total of 18 unique well IDs located within 100 m of the route, which includes 4 water supply wells and 14 observation wells. **Table K2** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 45.4 mbgs and 3.1 mbgs, with an average depth of approximately 9.9 mbgs. Records of static water levels range between 14 mbgs and 2.4 mbgs with an average static level of 5.7 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 45.4 mbgs to 1.6 mbgs, with an average “water found” depth of 18.1 mbgs. Bedrock was reported to be encountered between 6.4 mbgs and 4.9 mbgs with an average depth of 5.7 mbgs. Depth to bedrock was recorded in one well (Well ID 1508882) at a depth of 6.4 mbgs, however, this is from a record of an extended well (depth to bedrock may be less than what is noted).

Table K2: Water Well Records within 100 m of Phase 3 IP Segment 2

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500404	71.2	14.0	57.2	18.3	6.1	17.1	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1508882	71.0	3.4	67.6	45.4	6.4	45.4	Water Supply
1535863	71.0	N/A	N/A	4.9	N/A	3.0	Abandoned-Quality
7174555	71.0	N/A	N/A	5.6	N/A	1.6	Observation Well
7191532	70.0	N/A	N/A	12.1	N/A	N/A	Abandoned-Supply
7191555	69.7	N/A	N/A	4.0	N/A	N/A	Observation Well
7191556	69.9	N/A	N/A	7.6	N/A	N/A	Observation Well
7191557	70.0	N/A	N/A	4.0	N/A	N/A	Observation Well
7191558	70.5	N/A	N/A	5.8	N/A	N/A	Observation Well
7191559	69.8	N/A	N/A	4.9	N/A	N/A	Observation Well
7191560	70.0	N/A	N/A	4.0	N/A	N/A	Observation Well
7205218	69.9	N/A	N/A	4.0	N/A	N/A	Observation Well
7205219	69.9	N/A	N/A	4.3	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7205220	69.9	N/A	N/A	3.1	N/A	N/A	Observation Well
7205221	70.0	N/A	N/A	3.7	N/A	N/A	Observation Well
7205222	70.0	N/A	N/A	4.0	N/A	N/A	Observation Well

Phase 3 IP Segment 3 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 3 IP Segment 3 to better understand local groundwater conditions. There were a total of 25 unique well IDs located within 100 m of the route, which includes 14 water supply wells, 6 observation wells, 2 records for well abandonment, and 3 records where the current status is not available. **Table K3** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 61.0 mbgs and 2.8 mbgs, with an average depth of approximately 19.8 mbgs. Records of static water levels range between 6.1 mbgs and 1.2 mbgs with an average static level of 3.1 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 39.6 mbgs to 11.6 mbgs, with an average “water found” depth of 22.8 mbgs. Bedrock was reported to be encountered between 6.7 mbgs and 1.2 mbgs with an average depth of 4.0 mbgs.

Table K3: Water Well Records within 100 m of Phase 3 IP Segment 3

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501367	71.0	4.9	66.1	35.7	4.9	35.7	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501379	70.2	1.8	68.4	21.0	1.8	21.0	Water Supply
1501381	70.5	3.7	66.8	19.8	3.0	19.8	Water Supply
1501395	70.5	3.0	67.5	12.2	5.5	11.6	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1536870	68.3	N/A	N/A	5.1	4.3	N/A	Observation Well
7209247	58.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Observation

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7242903	64.4	N/A	N/A	N/A	N/A	N/A	N/A
7252238	64.2	N/A	N/A	N/A	N/A	N/A	N/A
7254961	65.9	N/A	N/A	N/A	N/A	N/A	Abandoned- Observation
7290571	64.1	N/A	N/A	N/A	N/A	N/A	N/A

Phase 3 IP Segment 4 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 3 IP Segment 4 to better understand local groundwater conditions. There were a total of 17 unique well IDs located within 100 m of the route, which includes 1 water supply well, 15 observation wells, and 1 record for well abandonment. **Table K4** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 21.3 mbgs and 3.7 mbgs, with an average depth of approximately 6.7 mbgs. One record indicated static water level at 5.5 mbgs, “water found” depth of 21.3 mbgs, and that bedrock was reported to be encountered at 9.1 mbgs.

Table K4: Water Well Records within 100 m of Phase 3 IP Segment 4

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501495	69.6	5.5	64.1	21.3	9.1	21.3	Water Supply
7130500	70.0	N/A	N/A	5.2	N/A	N/A	Observation Well
7184929	75.2	N/A	N/A	7.3	N/A	N/A	Observation Well
7197902	71.8	N/A	N/A	3.7	N/A	N/A	Observation Well
7249254	74.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7270006	75.2	N/A	N/A	4.3	N/A	N/A	Observation Well
7270007	74.9	N/A	N/A	4.6	N/A	N/A	Observation Well
7270008	75.4	N/A	N/A	5.3	N/A	N/A	Observation Well
7273558	71.2	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7275269	74.2	N/A	N/A	6.1	N/A	N/A	Observation Well
7275303	74.3	N/A	N/A	6.1	N/A	N/A	Observation Well
7275304	73.0	N/A	N/A	6.1	N/A	N/A	Observation Well
7275305	76.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7275306	76.4	N/A	N/A	6.1	N/A	N/A	Observation Well
7275307	74.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7286481	74.0	N/A	N/A	6.1	N/A	N/A	Observation Well
7286482	74.3	N/A	N/A	6.1	N/A	N/A	Observation Well

Phase 4 XHP Preferred Route – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of the Phase 4 XHP Preferred Route to better understand local groundwater conditions. There were a total of 74 unique well IDs located within 100 m of the route, which includes 36 water supply wells, 27 observation wells, 5 records for well abandonment, and 7 records where the current status is not available.

Table K5 summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 61 mbgs and 1.8 mbgs, with an average depth of approximately 14.5 mbgs. Records of static water levels range between 6.1 mbgs and 1.2 mbgs with an average static level of 1.3 mbgs. Based on evaluation of the drilling contractors' notes contained in the well logs, groundwater was found at depths ranging from 45.7 mbgs to 0.9 mbgs, with an average "water found" depth of 22.8 mbgs. Bedrock was reported to be encountered between 15.2 mbgs and 1.2 mbgs with an average depth of 2.0 mbgs.

Table K5: Water Well Records within 100 m of Phase 4 XHP Preferred Route

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500406	58.4	N/A	N/A	19.8	2.4	17.7	Water Supply
1500408	58.4	3.0	55.4	28.0	3.7	25.9	Water Supply
1500413	58.7	3.0	55.7	27.4	9.1	22.9	Water Supply
1501113	69.4	3.0	66.4	29.0	1.5	18.3	Water Supply
1501114	69.4	3.0	66.4	27.4	1.5	18.3	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501123	72.5	1.5	71.0	27.4	N/A	23.2	Water Supply
1501129	71.9	3.7	68.2	28.0	N/A	28.0	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501135	69.3	1.2	68.1	44.8	3.4	43.6	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501137	69.9	3.7	66.2	29.6	7.6	28.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501337	69.9	4.6	65.3	12.2	5.5	11.6	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501347	72.8	4.6	68.2	35.1	4.3	35.1	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501350	70.8	2.4	68.4	18.3	2.4	18.3	Water Supply
1501352	71.9	1.2	70.7	27.4	6.4	18.6	Water Supply
1501353	70.9	1.8	69.1	26.2	6.1	26.2	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501370	72.1	2.4	69.7	22.3	3.0	22.3	Water Supply
1501374	68.1	3.7	64.4	26.8	2.1	N/A	Water Supply
1501375	68.0	3.0	65.0	33.2	4.6	N/A	Water Supply
1501376	71.5	1.8	69.7	16.2	2.4	14.0	Water Supply
1501377	68.1	2.4	65.7	19.8	3.0	19.8	Water Supply
1501378	67.8	1.8	66.0	15.2	1.5	15.2	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501384	71.9	2.7	69.2	22.6	5.5	22.6	Water Supply
1501391	68.6	2.4	66.2	27.4	2.4	18.3	Water Supply
1501394	72.3	3.0	69.3	25.9	2.7	23.8	Water Supply
1501396	68.6	3.7	64.9	45.7	15.2	45.7	Water Supply
1508501	68.1	1.2	66.9	7.6	2.7	7.6	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1535302	69.5	N/A	N/A	N/A	N/A	3.0	Abandoned-Supply
7038978	71.8	N/A	N/A	6.0	2.1	N/A	Observation Well
7052171	71.8	N/A	N/A	N/A	N/A	N/A	Abandoned-Observation
7101796	58.4	N/A	N/A	N/A	N/A	N/A	Observation Well
7101796	59.9	N/A	N/A	N/A	N/A	N/A	Observation Well
7101796	60.4	N/A	N/A	N/A	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7144093	68.9	N/A	N/A	1.8	N/A	N/A	Observation Well
7157667	72.9	N/A	N/A	4.3	N/A	N/A	Observation Well
7157668	72.8	N/A	N/A	3.1	N/A	N/A	Observation Well
7160470	66.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7162036	66.1	N/A	N/A	5.8	N/A	N/A	Observation Well
7164270	65.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7181399	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7181402	67.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7207347	72.3	N/A	N/A	7.3	N/A	N/A	N/A
7209247	58.4	2.8	N/A	N/A	N/A	N/A	Abandoned-Observation

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7216892	70.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7242903	64.4	N/A	N/A	N/A	N/A	N/A	N/A
7246051	51.9	N/A	N/A	N/A	N/A	N/A	Abandoned-Observation
7252238	64.2	N/A	N/A	N/A	N/A	N/A	N/A
7253996	67.7	N/A	N/A	3.8	N/A	N/A	Observation Well
7253997	68.8	N/A	N/A	3.8	N/A	N/A	Observation Well
7253998	68.5	N/A	N/A	3.8	N/A	N/A	Observation Well
7254961	65.9	N/A	N/A	N/A	N/A	N/A	Abandoned-Observation
7269213	68.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7269214	69.0	N/A	N/A	6.1	N/A	N/A	Observation Well
7269215	68.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7276704	67.6	N/A	N/A	N/A	N/A	N/A	Abandoned-Observation
7282848	68.9	N/A	N/A	2.7	N/A	N/A	Observation Well
7282849	69.0	N/A	N/A	2.7	N/A	N/A	Observation Well
7290571	64.1	N/A	N/A	N/A	N/A	N/A	N/A

Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard) – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard) to better understand local groundwater conditions. There were a total of 3 unique well IDs located within 100 m of the route, which includes one observation well, 1 record for well abandonment and 1 record where the current status is not available. **Table K6** summarizes the reported information for these wells. The wells identified within 100 m of this route have only one depth reported as 5.5 mbgs. Records of static water levels were not available. Drilling contractors' notes were not contained in the well logs for groundwater or bedrock.

Table K6: Water Well Records within 100 m of Phase 4 XHP Preferred Route, NPS 4-inch Segment (St. Laurent Boulevard)

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned - Observation
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A

Phase 4 XHP Preferred Route, NPS 4-inch Segment (Hemlock Road) – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP Preferred Route, NPS 4-inch Segment (Hemlock Road) to better understand local groundwater conditions. There were a total of 2 unique well IDs located within 100 m of the route, which includes 1 observation well and 1 record for well abandonment. **Table K7** summarizes the reported information for these wells. The wells identified within 100 m of this route have only one depth reported as 5.5 mbgs. Records of static water levels were not available. Drilling contractors' notes were not contained in the well logs for groundwater or bedrock.

Table K7: Water Well Records within 100 m of Phase 4 XHP Preferred Route, NPS 4-inch Segment (Hemlock Road)

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned - Observation
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well

Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road) – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road) to better understand local groundwater conditions. There were a total of 19 unique well IDs located within 100 m of the route, which includes 5 water supply wells, 13 observation wells, and 1 record where the current status is not available. **Table K8** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 48. mbgs and 2.3 mbgs, with an average depth of approximately 11.8 mbgs. Records of static water levels range between 8.5 mbgs and 1.8 mbgs with an average static level of 4.3 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 27.4 mbgs to 15.2 mbgs, with an average “water found” depth of 22.1 mbgs. Bedrock was reported to be encountered between 10.7 mbgs and 1.8 mbgs, with an average depth of 6.6 mbgs.

Table K8: Water Well Records within 100 m of Phase 4 XHP Preferred Route, NPS 6-inch Segment (Montreal Road)

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501133	72.5	N/A	N/A	26.2	1.8	26.2	Water Supply
1508526	78.9	1.8	77.1	20.1	4.9	15.2	Water Supply
1508527	77.3	4.9	72.4	48.8	8.8	21.3	Water Supply
1508529	75.2	8.5	66.7	34.7	10.7	27.4	Water Supply
1508880	68.3	6.4	61.9	24.4	6.7	20.7	Water Supply
7109061	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109062	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109370	68.3	6.6	61.7	N/A	N/A	N/A	Observation Well
7109370	68.5	5.9	62.6	N/A	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7170720	76.6	N/A	N/A	12.2	N/A	N/A	Observation Well
7170721	76.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7184919	68.5	N/A	N/A	7.3	N/A	N/A	Observation Well
7224110	75.8	N/A	N/A	2.7	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7224147	75.4	N/A	N/A	2.3	N/A	N/A	Observation Well
7224148	75.1	N/A	N/A	2.4	N/A	N/A	Observation Well
7224149	76.0	N/A	N/A	2.7	N/A	N/A	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7290015	69.2	N/A	N/A	7.6	N/A	N/A	Observation Well

Phase 4 XHP North-South Alternative 1 – Well information contained in the MECPC (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP North-South Alternative 1 to better understand local groundwater conditions. There were a total of 91 unique well IDs located within 100 m of the route, which includes 37 water supply wells, 42 observation wells, 7 records for well abandonment and 5 records where the current status is not available. **Table K9** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 123.4 mbgs and 2.3 mbgs, with an average depth of approximately 15.5 mbgs. Records of static water levels range between 9.1 mbgs and 1.2 mbgs with an average static level of 3.2 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 45.7 mbgs to 0.5 mbgs, with an average “water found” depth of 24.2 mbgs. Bedrock was reported to be encountered between 15.2 mbgs and 1.5 mbgs, with an average depth of 3.8 mbgs.

Table K9: Water Well Records within 100 m of Phase 4 XHP North-South Alternative 1

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501113	69.4	3.0	66.4	29.0	1.5	18.3	Water Supply
1501114	69.4	3.0	66.4	27.4	1.5	18.3	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501117	72.9	3.4	69.5	18.9	7.6	18.9	Water Supply
1501119	72.9	5.2	67.7	32.0	4.6	24.4	Water Supply
1501120	73.2	9.1	64.1	123.4	4.0	91.4	Water Supply
1501121	73.5	2.7	70.8	30.2	5.5	30.2	Water Supply
1501122	72.8	5.2	67.6	18.9	0.9	17.1	Water Supply
1501124	72.0	1.5	70.5	19.8	1.5	10.7	Water Supply
1501125	73.5	3.0	70.5	30.2	3.7	27.4	Water Supply
1501126	72.0	2.4	69.6	38.1	N/A	27.4	Water Supply
1501127	71.5	2.4	69.1	24.4	1.2	23.2	Water Supply
1501128	71.6	4.9	66.7	44.2	8.5	24.4	Water Supply
1501129	71.9	3.7	68.2	28.0	N/A	28.0	Water Supply
1501133	72.5	N/A	N/A	26.2	1.8	26.2	Water Supply
1501347	72.8	4.6	68.2	35.1	4.3	35.1	Water Supply
1501350	70.8	2.4	68.4	18.3	2.4	18.3	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501352	71.9	1.2	70.7	27.4	6.4	18.6	Water Supply
1501353	70.9	1.8	69.1	26.2	6.1	26.2	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501370	72.1	2.4	69.7	22.3	3.0	22.3	Water Supply
1501374	68.1	3.7	64.4	26.8	2.1	N/A	Water Supply
1501375	68.0	3.0	65.0	33.2	4.6	N/A	Water Supply
1501376	71.5	1.8	69.7	16.2	2.4	14.0	Water Supply
1501377	68.1	2.4	65.7	19.8	3.0	19.8	Water Supply
1501378	67.8	1.8	66.0	15.2	1.5	15.2	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501384	71.9	2.7	69.2	22.6	5.5	22.6	Water Supply
1501391	68.6	2.4	66.2	27.4	2.4	18.3	Water Supply
1501394	72.3	3.0	69.3	25.9	2.7	23.8	Water Supply
1501396	68.6	3.7	64.9	45.7	15.2	45.7	Water Supply
1508168	72.1	N/A	N/A	70.1	N/A	N/A	Abandoned-Supply
1508501	68.1	1.2	66.9	7.6	2.7	7.6	Water Supply
1508526	78.9	1.8	77.1	20.1	4.9	15.2	Water Supply
1508527	77.3	4.9	72.4	48.8	8.8	21.3	Water Supply
1508529	75.2	8.5	66.7	34.7	10.7	27.4	Water Supply
1508880	68.3	6.4	61.9	24.4	6.7	20.7	Water Supply
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned - Other
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7038978	71.8	N/A	N/A	6.0	2.1	N/A	Observation Well
7043234	72.0	N/A	N/A	4.3	N/A	N/A	Abandoned-Other
7052171	71.8	N/A	N/A	N/A	N/A	N/A	Abandoned-Quality
7109061	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109062	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109370	68.3	6.6	61.7	N/A	N/A	N/A	Observation Well
7109370	68.5	5.9	62.6	N/A	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7144093	68.9	N/A	N/A	1.8	N/A	N/A	Observation Well
7159001	72.4	N/A	N/A	4.8	N/A	N/A	Observation Well
7160470	66.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7162036	66.1	N/A	N/A	5.8	N/A	N/A	Observation Well
7163230	72.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7163231	73.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163232	72.6	N/A	N/A	N/A	N/A	N/A	Observation Well
7164270	65.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7170720	76.6	N/A	N/A	12.2	N/A	N/A	Observation Well
7170721	76.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7177893	72.1	N/A	N/A	N/A	N/A	N/A	N/A
7181399	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7181402	67.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7184919	68.5	N/A	N/A	7.3	N/A	N/A	Observation Well
7207347	72.3	N/A	N/A	N/A	N/A	N/A	N/A
7210981	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210982	72.5	N/A	N/A	14.9	N/A	N/A	Observation Well
7210983	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210984	72.1	N/A	N/A	12.2	N/A	N/A	Observation Well
7216892	70.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7217546	77.0	N/A	N/A	4.9	N/A	N/A	Observation Well
7224110	75.8	N/A	N/A	2.7	N/A	N/A	Observation Well
7224147	75.4	N/A	N/A	2.3	N/A	N/A	Observation Well
7224148	75.1	N/A	N/A	2.4	N/A	N/A	Observation Well
7224149	76.0	N/A	N/A	2.7	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7241758	76.1	N/A	N/A	2.7	N/A	0.5	Observation Well
7253996	67.7	N/A	N/A	3.8	N/A	N/A	Observation Well
7253997	68.8	N/A	N/A	3.8	N/A	N/A	Observation Well
7253998	68.5	N/A	N/A	3.8	N/A	N/A	Observation Well
7269213	68.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7269214	69.0	N/A	N/A	6.1	N/A	N/A	Observation Well
7269215	68.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7276704	67.6	N/A	N/A	N/A	N/A	N/A	N/A
7282848	68.9	N/A	N/A	2.7	N/A	N/A	Observation Well
7282849	69.0	N/A	N/A	2.7	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A
7290015	69.2	N/A	N/A	7.6	N/A	N/A	Observation Well

Phase 4 XHP North-South Alternative 2 – Well information contained in the MECPC (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP North-South Alternative 2 to better understand local groundwater conditions. There were a total of 82 unique well IDs located within 100 m of the route, which includes 35 water supply wells, 34 observation wells, 7 records for well abandonment, and 6 records where the current status is not available. **Table K10** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 123.4 mbgs and 2.4 mbgs, with an average depth of approximately 17.4 mbgs. Records of static water levels range between 9.1 mbgs and 1.2 mbgs with an average static level of 3.1 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 91.4 mbgs to 7.6 mbgs, with an average “water found” depth of 24.7 mbgs. Bedrock was reported to be encountered between 15.2 mbgs and 0.9 mbgs with an average depth of 4.0 mbgs.

Table K10: Water Well Records within 100 m of Phase 4 XHP North-South Alternative 2

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501113	69.4	3.0	66.4	29.0	1.5	18.3	Water Supply
1501114	69.4	3.0	66.4	27.4	1.5	18.3	Water Supply
1501115	71.2	0.0	71.2	42.7	6.7	36.6	Water Supply
1501117	72.9	3.4	69.5	18.9	7.6	18.9	Water Supply
1501119	72.9	5.2	67.7	32.0	4.6	24.4	Water Supply
1501120	73.2	9.1	64.1	123.4	4.0	91.4	Water Supply
1501121	73.5	2.7	70.8	30.2	5.5	30.2	Water Supply
1501122	72.8	5.2	67.6	18.9	0.9	17.1	Water Supply
1501124	72.0	1.5	70.5	19.8	1.5	10.7	Water Supply
1501125	73.5	3.0	70.5	30.2	3.7	27.4	Water Supply
1501126	72.0	2.4	69.6	38.1	N/A	27.4	Water Supply
1501127	71.5	2.4	69.1	24.4	1.2	23.2	Water Supply
1501128	71.6	4.9	66.7	44.2	8.5	24.4	Water Supply
1501129	71.9	3.7	68.2	28.0	N/A	28.0	Water Supply
1501347	72.8	4.6	68.2	35.1	4.3	35.1	Water Supply
1501350	70.8	2.4	68.4	18.3	2.4	18.3	Water Supply
1501352	71.9	1.2	70.7	27.4	6.4	18.6	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501353	70.9	1.8	69.1	26.2	6.1	26.2	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501370	72.1	2.4	69.7	22.3	3.0	22.3	Water Supply
1501374	68.1	3.7	64.4	26.8	2.1	N/A	Water Supply
1501375	68.0	3.0	65.0	33.2	4.6	N/A	Water Supply
1501376	71.5	1.8	69.7	16.2	2.4	14.0	Water Supply
1501377	68.1	2.4	65.7	19.8	3.0	19.8	Water Supply
1501378	67.8	1.8	66.0	15.2	1.5	15.2	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501384	71.9	2.7	69.2	22.6	5.5	22.6	Water Supply
1501391	68.6	2.4	66.2	27.4	2.4	18.3	Water Supply
1501394	72.3	3.0	69.3	25.9	2.7	23.8	Water Supply
1501396	68.6	3.7	64.9	45.7	15.2	45.7	Water Supply
1508168	72.1	N/A	N/A	70.1	N/A	N/A	Abandoned-Supply
1508501	68.1	1.2	66.9	7.6	2.7	7.6	Water Supply
1508526	78.9	1.8	77.1	20.1	4.9	15.2	Water Supply
1508527	77.3	4.9	72.4	48.8	8.8	21.3	Water Supply
1508533	86.3	2.4	83.9	24.4	7.9	18.3	Water Supply
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7038978	71.8	N/A	N/A	6.0	2.1	N/A	Observation Well
7043234	72.0	N/A	N/A	4.3	N/A	N/A	Abandoned-Other
7052171	71.8	N/A	N/A	v	N/A	N/A	Abandoned-Quality
7109061	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109062	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7144093	68.9	N/A	N/A	1.8	N/A	N/A	Observation Well
7159001	72.4	N/A	N/A	4.8	N/A	N/A	Observation Well
7160470	66.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7162036	66.1	N/A	N/A	5.8	N/A	N/A	Observation Well
7163230	72.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163231	73.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163232	72.6	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7164270	65.7	N/A	N/A	2.4	N/A	N/A	Observation Well
7170720	76.6	N/A	N/A	12.2	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7170721	76.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7177893	72.1	N/A	N/A	N/A	N/A	N/A	N/A
7181399	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7181402	67.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7207347	72.3	N/A	N/A	N/A	N/A	N/A	N/A
7210981	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210982	72.5	N/A	N/A	14.9	N/A	N/A	Observation Well
7210983	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210984	72.1	N/A	N/A	12.2	N/A	N/A	Observation Well
7216892	70.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7217546	77.0	N/A	N/A	4.9	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7241758	76.1	N/A	N/A	2.7	N/A	0.5	Observation Well
7253996	67.7	N/A	N/A	3.8	N/A	N/A	Observation Well
7253997	68.8	N/A	N/A	3.8	N/A	N/A	Observation Well
7253998	68.5	N/A	N/A	3.8	N/A	N/A	Observation Well
7269213	68.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7269214	69.0	N/A	N/A	6.1	N/A	N/A	Observation Well
7269215	68.8	N/A	N/A	6.1	N/A	N/A	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7276704	67.6	N/A	N/A	N/A	N/A	N/A	N/A
7282848	68.9	N/A	N/A	2.7	N/A	N/A	Observation Well
7282849	69.0	N/A	N/A	2.7	N/A	N/A	Observation Well
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A
7289473	86.4	N/A	N/A	N/A	N/A	N/A	N/A

Phase 4 XHP North-South Alternative 3 – Well information contained in the MECPC (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP North-South Alternative 3 to better understand local groundwater conditions. There were a total of 71 unique well IDs located within 100 m of the route, which includes 30 water supply wells, 30 observation wells, 7 records for well abandonment, and 4 records where the current status is not available. **Table K11** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 123.4 mbgs and 16.2 mbgs, with an average depth of approximately 31.1 mbgs. Records of static water levels range between 9.1 mbgs and 1.5 mbgs with an average static level of 3.3 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 91.4 mbgs to 10.7 mbgs, with an average “water found” depth of 25.7 mbgs. Bedrock was reported to be encountered between 10.7 mbgs and 0.9 mbgs with an average depth of 4.3 mbgs.

Table K11: Water Well Records within 100 m of Phase 4 XHP North-South Alternative 3

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500402	67.5	3.0	64.5	25.9	4.6	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501117	72.9	3.4	69.5	18.9	7.6	18.9	Water Supply
1501119	72.9	5.2	67.7	32.0	4.6	24.4	Water Supply
1501120	73.2	9.1	64.1	123.4	4.0	91.4	Water Supply
1501121	73.5	2.7	70.8	30.2	5.5	30.2	Water Supply
1501122	72.8	5.2	67.6	18.9	0.9	17.1	Water Supply
1501124	72.0	1.5	70.5	19.8	1.5	10.7	Water Supply
1501125	73.5	3.0	70.5	30.2	3.7	27.4	Water Supply
1501126	72.0	2.4	69.6	38.1	N/A	27.4	Water Supply
1501127	71.5	2.4	69.1	24.4	1.2	23.2	Water Supply
1501128	71.6	4.9	66.7	44.2	8.5	24.4	Water Supply
1501129	71.9	3.7	68.2	28.0	0.0	28.0	Water Supply
1501133	72.5	N/A	N/A	26.2	1.8	26.2	Water Supply
1501347	72.8	4.6	68.2	35.1	4.3	35.1	Water Supply
1501350	70.8	2.4	68.4	18.3	2.4	18.3	Water Supply
1501352	71.9	1.2	70.7	27.4	6.4	18.6	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501353	70.9	1.8	69.1	26.2	6.1	26.2	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501370	72.1	2.4	69.7	22.3	3.0	22.3	Water Supply
1501372	67.4	0.9	66.5	19.5	3.0	19.5	Water Supply
1501376	71.5	1.8	69.7	16.2	2.4	14.0	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501384	71.9	2.7	69.2	22.6	5.5	22.6	Water Supply
1501394	72.3	3.0	69.3	25.9	2.7	23.8	Water Supply
1508168	72.1	N/A	N/A	70.1	N/A	N/A	Abandoned-Supply
1508526	78.9	1.8	77.1	20.1	4.9	15.2	Water Supply
1508527	77.3	4.9	72.4	48.8	8.8	21.3	Water Supply
1508529	75.2	8.5	66.7	34.7	10.7	27.4	Water Supply
1508880	68.3	6.4	61.9	24.4	6.7	20.7	Water Supply
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7038978	71.8	N/A	N/A	6.0	2.1	N/A	Observation Well
7043234	72.0	N/A	N/A	4.3	N/A	N/A	Abandoned-Other
7052171	71.8	N/A	N/A	N/A	N/A	N/A	Abandoned-Quality
7109061	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109062	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109370	68.3	6.6	61.7	N/A	N/A	N/A	Observation Well
7109370	68.5	5.9	62.6	N/A	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7144093	68.9	N/A	N/A	1.8	N/A	N/A	Observation Well
7159001	72.4	N/A	N/A	4.8	N/A	N/A	Observation Well
7163230	72.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163231	73.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163232	72.6	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7170720	76.6	N/A	N/A	12.2	N/A	N/A	Observation Well
7170721	76.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7177893	72.1	N/A	N/A	N/A	N/A	N/A	N/A
7184919	68.5	N/A	N/A	7.3	N/A	N/A	Observation Well
7207347	72.3	N/A	N/A	N/A	N/A	N/A	N/A
7210981	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210982	72.5	N/A	N/A	14.9	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7210983	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210984	72.1	N/A	N/A	12.2	N/A	N/A	Observation Well
7216891	68.4	N/A	N/A	5.5	N/A	N/A	Observation Well
7216892	70.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7217546	77.0	N/A	N/A	4.9	N/A	N/A	Observation Well
7224110	75.8	N/A	N/A	2.7	N/A	N/A	Observation Well
7224147	75.4	N/A	N/A	2.3	N/A	N/A	Observation Well
7224148	75.1	N/A	N/A	2.4	N/A	N/A	Observation Well
7224149	76.0	N/A	N/A	2.7	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7241758	76.1	N/A	N/A	2.7	N/A	0.5	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A
7290015	69.2	N/A	N/A	7.6	N/A	N/A	Observation Well

Phase 4 XHP North-South Alternative 4 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP North-South Alternative 4 to better understand local groundwater conditions. There were a total of 71 unique well IDs located within 100 m of the route, which includes 30 water supply wells, 30 observation wells, 7 records for well abandonment, and 4 records where the current status is not available. **Table K12** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 123.4 mbgs and 1.8 mbgs, with an average depth of approximately 17.5 mbgs. Records of static water levels range between 9.1 mbgs and 0.9 mbgs with an average static level of 1.4 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 91.4 mbgs to 10.7 mbgs, with an average “water found” depth of 26.4 mbgs. Bedrock was reported to be encountered between 8.8 mbgs and 1.5 mbgs with an average depth of 4.0 mbgs.

Table K12: Water Well Records within 100 m of Phase 4 XHP North-South Alternative 4

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500402	67.5	3.0	64.5	25.9	4.6	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501117	72.9	3.4	69.5	18.9	7.6	18.9	Water Supply
1501119	72.9	5.2	67.7	32.0	4.6	24.4	Water Supply
1501120	73.2	9.1	64.1	123.4	4.0	91.4	Water Supply
1501121	73.5	2.7	70.8	30.2	5.5	30.2	Water Supply
1501122	72.8	5.2	67.6	18.9	0.9	17.1	Water Supply
1501124	72.0	1.5	70.5	19.8	1.5	10.7	Water Supply
1501125	73.5	3.0	70.5	30.2	3.7	27.4	Water Supply
1501126	72.0	2.4	69.6	38.1	N/A	27.4	Water Supply
1501127	71.5	2.4	69.1	24.4	1.2	23.2	Water Supply
1501128	71.6	4.9	66.7	44.2	8.5	24.4	Water Supply
1501129	71.9	3.7	68.2	28.0	N/A	28.0	Water Supply
1501347	72.8	4.6	68.2	35.1	4.3	35.1	Water Supply
1501350	70.8	2.4	68.4	18.3	2.4	18.3	Water Supply
1501352	71.9	1.2	70.7	27.4	6.4	18.6	Water Supply
1501353	70.9	1.8	69.1	26.2	6.1	26.2	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501370	72.1	2.4	69.7	22.3	3.0	22.3	Water Supply
1501372	67.4	0.9	66.5	19.5	3.0	19.5	Water Supply
1501376	71.5	1.8	69.7	16.2	2.4	14.0	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501384	71.9	2.7	69.2	22.6	5.5	22.6	Water Supply
1501394	72.3	3.0	69.3	25.9	2.7	23.8	Water Supply
1508168	72.1	N/A	N/A	70.1	N/A	N/A	Abandoned-Supply
1508526	78.9	1.8	77.1	20.1	4.9	15.2	Water Supply
1508527	77.3	4.9	72.4	48.8	8.8	21.3	Water Supply
1508533	86.3	2.4	83.9	24.4	7.9	18.3	Water Supply
1533759	66.5	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
1536675	65.7	N/A	N/A	5.5	N/A	N/A	Observation Well
7038978	71.8	N/A	N/A	6.0	2.1	N/A	Observation Well
7043234	72.0	N/A	N/A	4.3	N/A	N/A	Abandoned-Other
7052171	71.8	N/A	N/A	N/A	N/A	N/A	Abandoned-Quality
7109061	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7109062	82.0	N/A	N/A	8.8	N/A	N/A	Observation Well
7119887	82.6	N/A	N/A	8.8	N/A	N/A	Observation Well
7144093	68.9	N/A	N/A	1.8	N/A	N/A	Observation Well
7159001	72.4	N/A	N/A	4.8	N/A	N/A	Observation Well
7163230	72.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163231	73.4	N/A	N/A	N/A	N/A	N/A	Abandoned-Other
7163232	72.6	N/A	72.6	N/A	N/A	N/A	Abandoned-Other
7170720	76.6	N/A	N/A	12.2	N/A	N/A	Observation Well
7170721	76.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7177893	72.1	N/A	N/A	N/A	N/A	N/A	N/A
7207347	72.3	N/A	N/A	N/A	N/A	N/A	N/A
7210981	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210982	72.5	N/A	N/A	14.9	N/A	N/A	Observation Well
7210983	72.5	N/A	N/A	7.0	N/A	N/A	Observation Well
7210984	72.1	N/A	N/A	12.2	N/A	N/A	Observation Well
7216891	68.4	N/A	N/A	5.5	N/A	N/A	Observation Well
7216892	70.6	N/A	N/A	6.1	N/A	N/A	Observation Well
7217546	77.0	N/A	N/A	4.9	N/A	N/A	Observation Well

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well
7241758	76.1	N/A	N/A	2.7	N/A	0.5	Observation Well
7275954	83.5	N/A	N/A	N/A	N/A	N/A	N/A
7288368	59.8	N/A	N/A	N/A	N/A	N/A	N/A
7289473	86.4	N/A	N/A	N/A	N/A	N/A	N/A

Phase 4 XHP East-West Alternative 1 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP East-West Alternative 1 to better understand local groundwater conditions. There were a total of 46 unique well IDs located within 100 m of the route, which includes 36 water supply wells, 8 observation wells, and 2 records for well abandonment. **Table K13** summarizes the reported information for these wells. The wells identified within 100 m of this route range between 61 mbgs and 2.8 mbgs, with an average depth of approximately 23.4 mbgs. Records of static water levels range between 14.0 mbgs and 1.2 mbgs with an average static level of 3.5 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 53.0 mbgs to 1.6 mbgs, with an average “water found” depth of 23.6 mbgs. Bedrock was reported to be encountered between 9.1 mbgs and 1.2 mbgs with an average depth of 4.6 mbgs.

Table K13: Water Well Records within 100 m of Phase 4 XHP East-West Alternative 1

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500398	71.4	4.6	66.8	53.0	7.6	53.0	Water Supply
1500399	71.2	4.6	66.6	22.9	6.1	22.9	Water Supply
1500404	71.2	14.0	57.2	18.3	6.1	17.1	Water Supply
1500406	58.4	N/A	N/A	19.8	2.4	17.7	Water Supply
1500408	58.4	3.0	55.4	28.0	3.7	25.9	Water Supply
1500413	58.7	3.0	55.7	27.4	9.1	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501135	69.3	1.2	68.1	44.8	3.4	43.6	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501137	69.9	3.7	66.2	29.6	7.6	28.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501337	69.9	4.6	65.3	12.2	5.5	11.6	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501367	71.0	4.9	66.1	35.7	4.9	35.7	Water Supply
1501368	71.3	3.7	67.6	21.9	4.3	21.9	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501371	69.9	4.6	65.3	22.6	3.7	22.6	Water Supply
1501373	70.3	2.1	68.2	12.2	6.1	N/A	Water Supply
1501379	70.2	1.8	68.4	21.0	1.8	21.0	Water Supply
1501381	70.5	3.7	66.8	19.8	3.0	19.8	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501386	70.3	2.7	67.6	18.6	4.6	18.6	Water Supply
1501387	69.7	1.8	67.9	24.7	3.7	24.7	Water Supply
1501388	71.6	2.4	69.2	32.9	5.2	22.9	Water Supply
1501390	71.3	1.8	69.5	21.9	3.0	20.7	Water Supply
1501395	70.5	3.0	67.5	12.2	5.5	11.6	Water Supply
1501397	71.3	3.0	68.3	15.2	4.6	9.1	Water Supply
1508677	58.2	3.7	54.5	41.8	2.4	15.2	Water Supply
1508678	59.7	2.4	57.3	39.6	1.5	39.6	Water Supply
1508861	57.5	3.0	54.5	42.7	6.1	N/A	Water Supply
1508882	71.0	3.4	67.6	45.4	6.4	45.4	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1535863	71.0	N/A	N/A	4.9	N/A	3.0	Abandoned-Quality
7169093	60.0	2.4	57.6	5.3	N/A	N/A	Observation Well
7174555	71.0	N/A	N/A	5.6	N/A	1.6	Observation Well
7191558	70.5	N/A	N/A	5.8	N/A	N/A	Observation Well
7219573	58.7	N/A	N/A	N/A	N/A	N/A	Abandoned-Supply
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well

Phase 4 XHP East-West Alternative 2 – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP East-West Alternative 2 to better understand local groundwater conditions. There were a total of 45 unique well IDs located within 100 m of the route, which includes 37 water supply wells, 7 observation wells, and 1 abandoned well. **Table K14** summarizes the reported information for these wells. The wells identified within 100 m of this route range in depth between 61.0 mbgs and 2.8 mbgs, with an average depth of approximately 23.64 mbgs. Records of static water levels range between 14.0 mbgs and -0.6 mbgs with an average static level of 3.4 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 53.0 mbgs to 1.6 mbgs, with an average “water found” depth of 23.5 mbgs. Bedrock was reported to be encountered between 9.1 mbgs and 1.2 mbgs with an average depth of 4.6 mbgs.

Table K14: Water Well Records within 100 m of Phase 4 XHP East-West Alternative 2

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500398	71.4	4.6	66.8	53.0	7.6	53.0	Water Supply
1500399	71.2	4.6	66.6	22.9	6.1	22.9	Water Supply
1500404	71.2	14.0	57.2	18.3	6.1	17.1	Water Supply
1500406	58.4	N/A	N/A	19.8	2.4	17.7	Water Supply
1500408	58.4	3.0	55.4	28.0	3.7	25.9	Water Supply
1500413	58.7	3.0	55.7	27.4	9.1	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501135	69.3	1.2	68.1	44.8	3.4	43.6	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501137	69.9	3.7	66.2	29.6	7.6	28.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501337	69.9	4.6	65.3	12.2	5.5	11.6	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501367	71.0	4.9	66.1	35.7	4.9	35.7	Water Supply
1501368	71.3	3.7	67.6	21.9	4.3	21.9	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501371	69.9	4.6	65.3	22.6	3.7	22.6	Water Supply
1501373	70.3	2.1	68.2	12.2	6.1	N/A	Water Supply
1501379	70.2	1.8	68.4	21.0	1.8	21.0	Water Supply
1501381	70.5	3.7	66.8	19.8	3.0	19.8	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501386	70.3	2.7	67.6	18.6	4.6	18.6	Water Supply
1501387	69.7	1.8	67.9	24.7	3.7	24.7	Water Supply
1501388	71.6	2.4	69.2	32.9	5.2	22.9	Water Supply
1501390	71.3	1.8	69.5	21.9	3.0	20.7	Water Supply
1501395	70.5	3.0	67.5	12.2	5.5	11.6	Water Supply
1501397	71.3	3.0	68.3	15.2	4.6	9.1	Water Supply
1508659	59.7	-0.6	60.3	18.3	4.6	18.3	Water Supply
1508677	58.2	3.7	54.5	41.8	2.4	15.2	Water Supply
1508678	59.7	2.4	57.3	39.6	1.5	39.6	Water Supply
1508861	57.5	3.0	54.5	42.7	6.1	N/A	Water Supply
1508882	71.0	3.4	67.6	45.4	6.4	45.4	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1535863	71.0	N/A	N/A	4.9	N/A	3.0	Abandoned-Quality
7174555	71.0	N/A	N/A	5.6	N/A	1.6	Observation Well
7191558	70.5	N/A	N/A	5.8	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well

Phase 4 XHP East-West Alternatives 3A and 3B – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP East-West Alternatives 3A and 3B to better understand local groundwater conditions. There were a total of 49 unique well IDs located within 100 m of the routes, which includes 37 water supply wells, 10 observation wells, 1 record for well abandonment, and 1 record where the current status is not available. **Table K15** summarizes the reported information for these wells. The wells identified within 100 m of these routes range in depth between 61.0 mbgs and 2.8 mbgs, with an average depth of approximately 23.1 mbgs. Records of static water levels range between 14.0 mbgs and 1.2 mbgs with an average static level of 2.5 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 53.0 mbgs to 0.5 mbgs, with an average “water found” depth of 23.6 mbgs. Bedrock was reported to be encountered between 10.7 mbgs and 1.2 mbgs with an average depth of 4.6 mbgs.

Table K15: Water Well Records within 100 m of Phase 4 XHP East-West Alternatives 3A and 3B

Note: N/A indicates information not available in well record

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500398	71.4	4.6	66.8	53.0	7.6	53.0	Water Supply
1500399	71.2	4.6	66.6	22.9	6.1	22.9	Water Supply
1500404	71.2	14.0	57.2	18.3	6.1	17.1	Water Supply
1500406	58.4	N/A	N/A	19.8	2.4	17.7	Water Supply
1500408	58.4	3.0	55.4	28.0	3.7	25.9	Water Supply
1500413	58.7	3.0	55.7	27.4	9.1	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501135	69.3	1.2	68.1	44.8	3.4	43.6	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501137	69.9	3.7	66.2	29.6	7.6	28.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501337	69.9	4.6	65.3	12.2	5.5	11.6	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply
1501367	71.0	4.9	66.1	35.7	4.9	35.7	Water Supply
1501368	71.3	3.7	67.6	21.9	4.3	21.9	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501371	69.9	4.6	65.3	22.6	3.7	22.6	Water Supply
1501373	70.3	2.1	68.2	12.2	6.1	N/A	Water Supply
1501379	70.2	1.8	68.4	21.0	1.8	21.0	Water Supply
1501381	70.5	3.7	66.8	19.8	3.0	19.8	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501386	70.3	2.7	67.6	18.6	4.6	18.6	Water Supply
1501387	69.7	1.8	67.9	24.7	3.7	24.7	Water Supply
1501388	71.6	2.4	69.2	32.9	5.2	22.9	Water Supply
1501390	71.3	1.8	69.5	21.9	3.0	20.7	Water Supply
1501395	70.5	3.0	67.5	12.2	5.5	11.6	Water Supply
1501397	71.3	3.0	68.3	15.2	4.6	9.1	Water Supply
1508660	58.4	4.3	54.1	36.6	3.0	36.6	Water Supply
1508661	60.5	4.6	55.9	42.7	10.7	12.2	Water Supply
1508677	58.2	3.7	54.5	41.8	2.4	15.2	Water Supply
1508678	59.7	2.4	57.3	39.6	1.5	39.6	Water Supply
1508882	71.0	3.4	67.6	45.4	6.4	45.4	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1535863	71.0	N/A	N/A	4.9	N/A	0.9	Observation Well
7101796	58.4	N/A	N/A	0.0	N/A	N/A	Observation Well
7169093	60.0	N/A	N/A	0.0	N/A	N/A	N/A
7174555	71.0	N/A	N/A	5.6	N/A	0.5	Observation Well
7191558	70.5	N/A	N/A	5.8	N/A	N/A	Observation Well
7212049	60.2	N/A	N/A	4.6	N/A	N/A	Observation Well
7219573	58.7	N/A	N/A	0.0	N/A	N/A	Abandoned-Other
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well

Phase 4 XHP East-West Alternatives 4A and 4B – Well information contained in the MECP (2020c) WWIS was reviewed in the vicinity of Phase 4 XHP East-West Alternatives 4A and 4B to better understand local groundwater conditions. There were a total of 48 unique well IDs located within 100 m of the routes, which includes 38 water supply wells and 10 observation wells. **Table K16** summarizes the reported information for these wells. The wells identified within 100 m of these routes range between 61.0 mbgs and 2.8 mbgs, with an average depth of approximately 18.4 mbgs. Records of static water levels range between 14.0 mbgs and -0.6 mbgs with an average static level of 2.9 mbgs. Based on evaluation of the drilling contractors’ notes contained in the well logs, groundwater was found at depths ranging from 53.0 mbgs to 0.5 mbgs, with an average “water found” depth of 23.4 mbgs. Bedrock was reported to be encountered between 10.7 mbgs and 1.2 mbgs with an average depth of 4.1 mbgs.

Table K16: Water Well Records within 100 m of Phase 4 XHP East-West Alternatives 4A and 4B

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1500398	71.4	4.6	66.8	53.0	7.6	53.0	Water Supply
1500399	71.2	4.6	66.6	22.9	6.1	22.9	Water Supply
1500404	71.2	14.0	57.2	18.3	6.1	17.1	Water Supply
1500406	58.4	N/A	N/A	19.8	2.4	17.7	Water Supply
1500408	58.4	3.0	55.4	28.0	3.7	25.9	Water Supply
1500413	58.7	3.0	55.7	27.4	9.1	22.9	Water Supply
1501115	71.2	N/A	N/A	42.7	6.7	36.6	Water Supply
1501132	69.5	2.4	67.1	19.8	3.0	17.7	Water Supply
1501134	69.4	6.1	63.3	26.5	3.7	26.5	Water Supply
1501135	69.3	1.2	68.1	44.8	3.4	43.6	Water Supply
1501136	69.7	4.6	65.1	27.1	6.7	21.3	Water Supply
1501137	69.9	3.7	66.2	29.6	7.6	28.3	Water Supply
1501138	69.5	2.4	67.1	19.8	3.7	12.2	Water Supply
1501337	69.9	4.6	65.3	12.2	5.5	11.6	Water Supply
1501342	69.8	3.0	66.8	21.3	4.9	21.3	Water Supply
1501355	72.8	2.1	70.7	22.9	3.7	21.3	Water Supply
1501363	72.6	3.0	69.6	24.4	1.5	14.0	Water Supply

Well ID	Ground Elevation (masl)	Static Level (mbgs)	Static Elevation (masl)	Well Depth (mbgs)	Depth to Bedrock (mbgs)	Water Found (mbgs)	Well Status
1501367	71.0	4.9	66.1	35.7	4.9	35.7	Water Supply
1501368	71.3	3.7	67.6	21.9	4.3	21.9	Water Supply
1501369	70.2	2.4	67.8	20.4	5.5	20.4	Water Supply
1501371	69.9	4.6	65.3	22.6	3.7	22.6	Water Supply
1501373	70.3	2.1	68.2	12.2	6.1	N/A	Water Supply
1501379	70.2	1.8	68.4	21.0	1.8	21.0	Water Supply
1501381	70.5	3.7	66.8	19.8	3.0	19.8	Water Supply
1501382	70.6	4.6	66.0	42.4	5.5	42.4	Water Supply
1501386	70.3	2.7	67.6	18.6	4.6	18.6	Water Supply
1501387	69.7	1.8	67.9	24.7	3.7	24.7	Water Supply
1501388	71.6	2.4	69.2	32.9	5.2	22.9	Water Supply
1501390	71.3	1.8	69.5	21.9	3.0	20.7	Water Supply
1501395	70.5	3.0	67.5	12.2	5.5	11.6	Water Supply
1501397	71.3	3.0	68.3	15.2	4.6	9.1	Water Supply
1508659	59.7	-0.6	60.3	18.3	4.6	18.3	Water Supply
1508660	58.4	4.3	54.1	36.6	3.0	36.6	Water Supply
1508661	60.5	4.6	55.9	42.7	10.7	12.2	Water Supply
1508677	58.2	3.7	54.5	41.8	2.4	15.2	Water Supply
1508678	59.7	2.4	57.3	39.6	1.5	39.6	Water Supply
1508882	71.0	3.4	67.6	45.4	6.4	45.4	Water Supply
1510842	70.4	1.2	69.2	61.0	1.2	39.6	Water Supply
1535863	71.0	N/A	N/A	4.9	N/A	0.9	Observation Well
7101796	58.4	N/A	N/A	0.0	N/A	N/A	Observation Well
7174555	71.0	N/A	N/A	5.6	N/A	0.5	Observation Well
7191558	70.5	N/A	N/A	5.8	N/A	N/A	Observation Well
7212049	60.2	N/A	N/A	4.6	N/A	N/A	Observation Well
7224187	72.1	N/A	N/A	3.1	N/A	N/A	Observation Well
7224188	72.3	N/A	N/A	2.8	N/A	N/A	Observation Well
7224189	71.6	N/A	N/A	4.6	N/A	N/A	Observation Well
7224358	72.4	N/A	N/A	3.1	N/A	N/A	Observation Well
7224359	72.3	N/A	N/A	3.1	N/A	N/A	Observation Well

Note: N/A indicates information not available in well record

Appendix L

Wildlife Species Records

Enbridge Gas Inc.

*St. Laurent Ottawa North Replacement Pipeline
Project*

June 2020 – 19-1850



Table L1: Wildlife Species Records**Notes:**

1. SARA (END = Endangered, THR = Threatened, SC = Special Concern)
2. Ontario Endangered Species Act, 2007 (END = Endangered, THR = Threatened, SC = Special Concern)
3. Ontario S-Rank (S5= widespread in Ontario; S4 = apparently secure; S3 = vulnerable; S2 = imperilled; S1 = extremely rare in Ontario; ? = inexact or uncertain; B = breeding status; N = non-breeding status; SX = extirpated from the province; SNA = not applicable/non-native; SH = possibly extirpated)
4. Information sources include: ARA = MNR's Aquatic Resource Area data; CBC = Christmas Bird Count; DFO = Fisheries and Oceans Canada; MECP = Ministry of Environment, Conservation and Parks; NHIC= Natural Heritage Information Centre; OBA = Ontario Butterfly Atlas; OBBA = Ontario Breeding Bird Atlas

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
BIRDS					
<i>Accipiter cooperii</i>	Cooper's Hawk	---	---	S4	CBC
<i>Accipiter gentilis</i>	Northern Goshawk	---	---	S4	CBC
<i>Accipiter striatus</i>	Sharp-shinned Hawk	---	---	S5	CBC
<i>Aquila chrysaetos</i>	Golden Eagle	---	END	S2B	CBC
<i>Buteo jamaicensis</i>	Red-tailed Hawk	---	---	S5	CBC
<i>Buteo lagopus</i>	Rough-legged Hawk	---	---	S1B,S4N	CBC
<i>Buteo lineatus</i>	Red-shouldered Hawk	---	---	S4B	CBC
<i>Haliaeetus leucocephalus</i>	Bald Eagle	---	SC	S2N,S4B	CBC
<i>Eremophila alpestris</i>	Horned Lark	---	---	S5B	CBC
<i>Megaceryle alcyon</i>	Belted Kingfisher	---	---	S4B	CBC
<i>Aix sponsa</i>	Wood Duck	---	---	S5	CBC
<i>Anas acuta</i>	Northern Pintail	---	---	S5	CBC
<i>Anas americana</i>	American Wigeon	---	---	S4	CBC
<i>Anas clypeata</i>	Northern Shoveler	---	---	S4	CBC
<i>Anas crecca</i>	Green-winged Teal	---	---	S4	CBC
<i>Anas platyrhynchos</i>	Mallard	---	---	S5	CBC, NHIC
<i>Anas rubripes</i>	American Black Duck	---	---	S4	CBC

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Anser albifrons</i>	Greater White-fronted Goose	---	---	SNA	CBC
<i>Aythya affinis</i>	Lesser Scaup	---	---	S4	CBC
<i>Branta canadensis</i>	Canada Goose	---	---	S5	CBC
<i>Branta hutchinsii</i>	Cackling Goose	---	---	S4N	CBC
<i>Bucephala albeola</i>	Bufflehead	---	---	S4	CBC
<i>Bucephala clangula</i>	Common Goldeneye	---	---	S5	CBC
<i>Bucephala islandica</i>	Barrow's Goldeneye	---	---	SNA	CBC
<i>Clangula hyemalis</i>	Long-tailed Duck	---	---	S3B	CBC
<i>Histrionicus histrionicus</i>	Harlequin Duck	---	---	SNA	CBC
<i>Lophodytes cucullatus</i>	Hooded Merganser	---	---	S5B,S5N	CBC
<i>Melanitta fusca</i>	White-winged Scoter	---	---	S4B,S4N	CBC
<i>Mergus merganser</i>	Common Merganser	---	---	S5B,S5N	CBC
<i>Mergus serrator</i>	Red-breasted Merganser	---	---	S4B,S5N	CBC
<i>Chaetura pelagica</i>	Chimney Swift	THR	THR	S4B,S4N	NHIC, OBBA
<i>Ardea herodias</i>	Great Blue Heron	---	---	S4	CBC
<i>Ixobrychus exilis</i>	Least Bittern	THR	THR	S4B	OBBA
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	---	---	S3B,S3N	CBC
<i>Bombycilla cedrorum</i>	Cedar Waxwing	---	---	S5B	CBC
<i>Bombycilla garrulus</i>	Bohemian Waxwing	---	---	SNA	CBC
<i>Plectrophenax nivalis</i>	Snow Bunting	---	---	SNA	CBC
<i>Chordeiles minor</i>	Common Nighthawk	THR	SC	S4B	OBBA
<i>Cardinalis cardinalis</i>	Northern Cardinal	---	---	S5	CBC
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	---	---	S4B	CBC
<i>Certhia americana</i>	Brown Creeper	---	---	S5B	CBC
<i>Columba livia</i>	Rock Pigeon	---	---	SNA	CBC
<i>Zenaidura macroura</i>	Mourning Dove	---	---	S5	CBC
<i>Corvus brachyrhynchos</i>	American Crow	---	---	S5B	CBC
<i>Corvus corax</i>	Common Raven	---	---	S5	CBC
<i>Cyanocitta cristata</i>	Blue Jay	---	---	S5	CBC

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Junco hyemalis</i>	Dark-eyed Junco	---	---	S5B	CBC
<i>Melospiza georgiana</i>	Swamp Sparrow	---	---	S5B	CBC
<i>Melospiza melodia</i>	Song Sparrow	---	---	S5B	CBC
<i>Passerella iliaca</i>	Fox Sparrow	---	---	S4B	CBC
<i>Spizelloides arborea</i>	American Tree Sparrow	---	---	S4B	CBC
<i>Zonotrichia albicollis</i>	White-throated Sparrow	---	---	S5B	CBC
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	---	---	S4B	CBC
<i>Falco columbarius</i>	Merlin	---	---	S5B	CBC
<i>Falco peregrinus</i>	Peregrine Falcon	SC	SC	S3B	CBC, OBBA
<i>Carduelis flammea</i>	Common Redpoll	---	---	S4B	CBC
<i>Carduelis hornemanni</i>	Hoary Redpoll	---	---	SNA	CBC
<i>Carduelis pinus</i>	Pine Siskin	---	---	S4B	CBC
<i>Carduelis tristis</i>	American Goldfinch	---	---	S5B	CBC
<i>Carpodacus mexicanus</i>	House Finch	---	---	SNA	CBC
<i>Carpodacus purpureus</i>	Purple Finch	---	---	S4B	CBC
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	---	SC	S4B	CBC
<i>Loxia curvirostra</i>	Red Crossbill	---	---	S4B	CBC
<i>Pinicola enucleator</i>	Pine Grosbeak	---	---	S4B	CBC
<i>Gavia immer</i>	Common Loon	---	---	S5B,S5N	CBC
<i>Hirundo rustica</i>	Barn Swallow	THR	THR	S4B	OBBA
<i>Riparia riparia</i>	Bank Swallow	THR	THR	S4B	OBBA
<i>Dolichonyx oryzivorus</i>	Bobolink	THR	THR	S4B	OBBA
<i>Euphagus carolinus</i>	Rusty Blackbird	SC	SC	S4B	CBC
<i>Quiscalus quiscula</i>	Common Grackle	---	---	S5B	CBC
<i>Sturnella magna</i>	Eastern Meadowlark	THR	THR	S4B	OBBA
<i>Lanius excubitor</i>	Northern Shrike	---	---	SNA	CBC
<i>Larus argentatus</i>	Herring Gull	---	---	S5B,S5N	CBC
<i>Larus delawarensis</i>	Ring-billed Gull	---	---	S5B,S4N	CBC
<i>Larus hyperboreus</i>	Glaucous Gull	---	---	S4N	CBC

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Larus marinus</i>	Great Black-backed Gull	---	---	S2B	CBC
<i>Dumetella carolinensis</i>	Gray Catbird	---	---	S4B	CBC
<i>Mimus polyglottos</i>	Northern Mockingbird	---	---	S4	CBC
<i>Poecile atricapillus</i>	Black-capped Chickadee	---	---	S5	CBC
<i>Cardellina canadensis</i>	Canada Warbler	THR	SC	S4B	OBBA
<i>Setophaga coronata</i>	Yellow-rumped Warbler	---	---	S5B	CBC
<i>Setophaga tigrina</i>	Cape May Warbler	---	---	S5B	CBC
<i>Passer domesticus</i>	House Sparrow	---	---	SNA	CBC
<i>Bonasa umbellus</i>	Ruffed Grouse	---	---	S4	CBC
<i>Meleagris gallopavo</i>	Wild Turkey	---	---	S5	CBC
<i>Colaptes auratus</i>	Northern Flicker	---	---	S4B	CBC
<i>Dryocopus pileatus</i>	Pileated Woodpecker	---	---	S5	CBC
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	---	---	S4	CBC
<i>Picoides arcticus</i>	Black-backed Woodpecker	---	---	S4	CBC
<i>Picoides dorsalis</i>	American Three-toed Woodpecker	---	---	S4	CBC
<i>Picoides pubescens</i>	Downy Woodpecker	---	---	S5	CBC
<i>Picoides villosus</i>	Hairy Woodpecker	---	---	S5	CBC
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	---	---	S5B	CBC
<i>Podiceps auritus</i>	Horned Grebe	---	SC	S1B,S4N	CBC
<i>Podiceps grisegena</i>	Red-necked Grebe	---	---	S3B,S4N	CBC
<i>Podilymbus podiceps</i>	Pied-billed Grebe	---	---	S4B,S4N	CBC
<i>Fulica americana</i>	American Coot	---	---	S4B	CBC
<i>Regulus calendula</i>	Ruby-crowned Kinglet	---	---	S4B	CBC
<i>Regulus satrapa</i>	Golden-crowned Kinglet	---	---	S5B	CBC
<i>Gallinago delicata</i>	Wilson's Snipe	---	---	S5B	CBC

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<i>Sitta canadensis</i>	Red-breasted Nuthatch	---	---	S5	CBC
<i>Sitta carolinensis</i>	White-breasted Nuthatch	---	---	S5	CBC
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	---	---	S4	CBC
<i>Bubo scandiacus</i>	Snowy Owl	---	---	SNA	CBC
<i>Bubo virginianus</i>	Great Horned Owl	---	---	S4	CBC
<i>Megascops asio</i>	Eastern Screech-Owl	---	---	S4	CBC
<i>Strix varia</i>	Barred Owl	---	---	S5	CBC
<i>Sturnus vulgaris</i>	European Starling	---	---	SNA	CBC
<i>Thryothorus ludovicianus</i>	Carolina Wren	---	---	S4	CBC
<i>Troglodytes troglodytes</i>	Winter Wren	---	---	S5B	CBC
<i>Catharus guttatus</i>	Hermit Thrush	---	---	S5B	CBC
<i>Catharus ustulatus</i>	Swainson's Thrush	---	---	S4B	CBC
<i>Hylocichla mustelina</i>	Wood Thrush	END	SC	S4B	CBC, OBBA
<i>Turdus migratorius</i>	American Robin	---	---	S5B	CBC
<i>Contopus virens</i>	Eastern Wood-pewee	SC	SC	S4B	NHIC, OBBA
MAMMALS					
<i>Canis latrans</i>	Coyote	---	---	S5	MWH
<i>Urocyon cinereoargenteus</i>	Gray Fox	THR	THR	S1	MWH
<i>Vulpes vulpes</i>	Red Fox	---	---	S5	MWH
<i>Castor canadensis</i>	Beaver	---	---	S5	MWH
<i>Odocoileus virginianus</i>	White-tailed Deer	---	---	S5	MWH
<i>Clethrionomys gapperi</i>	Southern Red-backed Vole	---	---	S5	MWH
<i>Microtus pennsylvanicus</i>	Meadow Vole	---	---	S5	MWH
<i>Ondatra zibethicus</i>	Muskrat	---	---	S5	MWH
<i>Peromyscus leucopus</i>	White-footed Mouse	---	---	S5	MWH

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Peromyscus maniculatus</i>	Deer Mouse	---	---	S5	MWH
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	---	---	S5	MWH
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	---	---	S5	MWH
<i>Erethizon dorsatum</i>	Porcupine	---	---	S5	MWH
<i>Lynx canadensis</i>	Canada Lynx	---	---	S5	MWH
<i>Lepus americanus</i>	Snowshoe Hare	---	---	S5	MWH
<i>Sylvilagus floridanus</i>	Eastern Cottontail	---	---	S5	MWH
<i>Mephitis mephitis</i>	Striped Skunk	---	---	S5	MWH
<i>Lontra canadensis</i>	North American River Otter	---	---	S5	MWH
<i>Martes americana</i>	American Marten	---	---	S5	MWH
<i>Martes pennanti</i>	Fisher	---	---	S5	MWH
<i>Mustela erminea</i>	Ermine	---	---	S5	MWH
<i>Mustela frenata</i>	Long-tailed Weasel	---	---	S4	MWH
<i>Mustela nivalis</i>	Least Weasel	---	---	SU	MWH
<i>Mustela vison</i>	American Mink	---	---	S4	MWH
<i>Procyon lotor</i>	Northern Raccoon	---	---	S5	MWH
<i>Glaucomys volans</i>	Southern Flying Squirrel	---	---	S4	MWH
<i>Marmota monax</i>	Woodchuck	---	---	S5	MWH
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	---	---	S5	MWH
<i>Tamias striatus</i>	Eastern Chipmunk	---	---	S5	MWH
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	---	---	S5	MWH
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	---	---	S5	MWH
<i>Sorex cinereus</i>	Masked Shrew	---	---	S5	MWH
<i>Sorex fumeus</i>	Smoky Shrew	---	---	S5	MWH
<i>Sorex hoyi</i>	Pygmy Shrew	---	---	S4	MWH
<i>Sorex palustris</i>	Water Shrew	---	---	S5	MWH
<i>Condylura cristata</i>	Star-nosed Mole	---	---	S5	MWH
<i>Parascalops breweri</i>	Hairy-tailed Mole	---	---	S4	MWH

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Ursus americanus</i>	American Black Bear	---	---	S5	MWH
<i>Eptesicus fuscus</i>	Big Brown Bat	---	---	S5	MWH
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	---	---	S4	MWH
<i>Lasiurus borealis</i>	Eastern Red Bat	---	---	S4	MWH
<i>Lasiurus cinereus</i>	Hoary Bat	---	---	S4	MWH
<i>Myotis leibii</i>	Eastern Small-footed Myotis	---	END	S2S3	MWH
<i>Myotis lucifugus</i>	Little Brown Myotis	END	END	S4	MWH
<i>Myotis septentrionalis</i>	Northern Myotis	END	END	S3	MWH
<i>Pipistrellus subflavus</i>	Tri-colored Bat	END	END	S3?	MWH
HERPTILES					
<i>Pseudacris triseriata</i> pop. 1	Western Chorus Frog (Great Lakes/St. Lawrence - Canadian Shield population)	THR	---	S3	MECP
<i>Chelydra serpentina</i>	Snapping Turtle	SC	SC	S3	MECP, NHIC
<i>Thamnophis sauritus</i>	Eastern Ribbonsnake (Great Lakes population)	SC	SC	S3	MECP
<i>Emydoidea blandingii</i>	Blanding's Turtle	THR	THR	S3	MECP, NHIC
<i>Graptemys geographica</i>	Northern Map Turtle	SC	SC	S3	MECP
<i>Sternotherus odoratus</i>	Eastern Musk Turtle	SC	SC	S3	MECP
FISH					
<i>Acipenser fulvescens</i> pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	---	END	S2	ARA, DFO
<i>Alosa pseudoharengus</i>	Alewife	---	---	SNA	ARA
<i>Alosa sapidissima</i>	American Shad	---	---	S1	ARA
<i>Ambloplites rupestris</i>	Rock Bass	---	---	S5	ARA
<i>Ameiurus natalis</i>	Yellow Bullhead	---	---	S4	ARA
<i>Ameiurus nebulosus</i>	Brown Bullhead	---	---	S5	ARA

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Anguilla rostrata</i>	American Eel	---	END	S1?	ARA, NHIC
<i>Aplodinotus grunniens</i>	Freshwater Drum	---	---	S5	ARA
<i>Carpiodes cyprinus</i>	Quillback	---	---	S4	ARA
<i>Catostomus catostomus</i>	Longnose Sucker	---	---	S5	ARA
<i>Catostomus commersoni</i>	White Sucker	---	---	S5	ARA
<i>Coregonus artedi</i>	Cisco	---	---	S5	ARA
<i>Cottus bairdi</i>	Mottled Sculpin	---	---	S5	ARA
<i>Cottus cognatus</i>	Slimy Sculpin	---	---	S5	ARA
<i>Culaea inconstans</i>	Brook Stickleback	---	---	S5	ARA
<i>Cyprinella spiloptera</i>	Spotfin Shiner	---	---	S4	ARA
<i>Cyprinus carpio</i>	Common Carp	---	---	SNA	ARA
<i>Esox lucius</i>	Northern Pike	---	---	S5	ARA
<i>Esox masquinongy</i>	Muskellunge	---	---	S4	ARA
<i>Etheostoma exile</i>	Iowa Darter	---	---	S5	ARA
<i>Etheostoma flabellare</i>	Fantail Darter	---	---	S4	ARA
<i>Etheostoma nigrum</i>	Johnny Darter	---	---	S5	ARA
<i>Etheostoma olmstedii</i>	Tessellated Darter	---	---	S4	ARA
<i>Exoglossum maxillingua</i>	Cutlip Minnow	---	THR	S1S2	ARA
<i>Fundulus diaphanus</i>	Banded Killifish	---	---	S5	ARA
<i>Hiodon tergisus</i>	Mooneye	---	---	S4	ARA
<i>Hybognathus hankinsoni</i>	Brassy Minnow	---	---	S5	ARA
<i>Hybognathus regius</i>	Eastern Silvery Minnow	---	---	S2	ARA
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (Great Lakes - Upper St. Lawrence populations)	SC	SC	S3	ARA, DFO, NHIC
<i>Ichthyomyzon unicuspis</i>	Silver Lamprey	---	---	S3	ARA, DFO
<i>Ictalurus punctatus</i>	Channel Catfish	---	---	S4	ARA
<i>Labidesthes sicculus</i>	Brook Silverside	---	---	S4	ARA

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<i>Lampetra appendix</i>	American Brook Lamprey	---	---	S3	ARA
<i>Lepisosteus osseus</i>	Longnose Gar	---	---	S4	ARA
<i>Lepomis gibbosus</i>	Pumpkinseed	---	---	S5	ARA
<i>Lepomis macrochirus</i>	Bluegill	---	---	S5	ARA
<i>Lepomis peltastes</i>	Northern Sunfish (Great Lakes – Upper St. Lawrence population)	---	SC	S3	ARA
<i>Lota lota</i>	Burbot	---	---	S5	ARA
<i>Luxilus cornutus</i>	Common Shiner	---	---	S5	ARA
<i>Margariscus margarita</i>	Pearl Dace	---	---	S5	ARA
<i>Micropterus dolomieu</i>	Smallmouth Bass	---	---	S5	ARA
<i>Micropterus salmoides</i>	Largemouth Bass	---	---	S5	ARA
<i>Moxostoma anisurum</i>	Silver Redhorse	---	---	S4	ARA
<i>Moxostoma carinatum</i>	River Redhorse	SC	SC	S2	ARA, DFO
<i>Moxostoma macrolepidotum</i>	Shorthead Redhorse	---	---	S5	ARA
<i>Moxostoma valenciennesi</i>	Greater Redhorse	---	---	S3	ARA, NHIC
<i>Notemigonus crysoleucas</i>	Golden Shiner	---	---	S5	ARA
<i>Notropis atherinoides</i>	Emerald Shiner	---	---	S5	ARA
<i>Notropis heterodon</i>	Blackchin Shiner	---	---	S4	ARA
<i>Notropis rubellus</i>	Rosyface Shiner	---	---	S4	ARA
<i>Notropis stramineus</i>	Sand Shiner	---	---	S4	ARA
<i>Notropis volucellus</i>	Mimic Shiner	---	---	S5	ARA
<i>Noturus flavus</i>	Stonecat	---	---	S4	ARA
<i>Noturus gyrinus</i>	Tadpole Madtom	---	---	S4	ARA
<i>Noturus insignis</i>	Margined Madtom	---	---	SU	ARA
<i>Osmerus mordax</i>	Rainbow Smelt	---	---	S5	ARA
<i>Perca flavescens</i>	Yellow Perch	---	---	S5	ARA
<i>Percina caprodes</i>	Logperch	---	---	S5	ARA
<i>Percina copelandi</i>	Channel Darter	SC	SC	S2	DFO

Scientific Name	Common Name	Federal Status ¹	Provincial Status ²	S-Rank ³	Info Source ⁴
<i>Percopsis omiscomaycus</i>	Trout-perch	---	---	S5	ARA
<i>Phoxinus eos</i>	Northern Redbelly Dace	---	---	S5	ARA
<i>Phoxinus neogaeus</i>	Finescale Dace	---	---	S5	ARA
<i>Pimephales notatus</i>	Bluntnose Minnow	---	---	S5	ARA
<i>Pimephales promelas</i>	Fathead Minnow	---	---	S5	ARA
<i>Pomoxis annularis</i>	White Crappie	---	---	S4	ARA
<i>Pomoxis nigromaculatus</i>	Black Crappie	---	---	S4	ARA
<i>Pungitius pungitius</i>	Ninespine Stickleback	---	---	S5	ARA
<i>Rhinichthys atratulus</i>	Blacknose Dace	---	---	S5	ARA
<i>Rhinichthys cataractae</i>	Longnose Dace	---	---	S5	ARA
<i>Salmo trutta</i>	Brown Trout	---	---	SNA	ARA
<i>Sander canadensis</i>	Sauger	---	---	S4	ARA
<i>Sander vitreus vitreus</i>	Walleye	---	---	S5	ARA
<i>Semotilus atromaculatus</i>	Creek Chub	---	---	S5	ARA
<i>Semotilus corporalis</i>	Fallfish	---	---	S4	ARA
<i>Umbra limi</i>	Central Mudminnow	---	---	S5	ARA
MOLLUSC					
<i>Obovaria olivaria</i>	Hickorynut	---	END	S1?	DFO
<i>Pyganodon cataracta</i>	Eastern Floater	---	---	S2	NHIC
LEPIDOPTERA					
<i>Danaus plexippus</i>	Monarch	SC	SC	S2N,S4B	OBA
NON-VASCULAR PLANTS					
<i>Brachythecium calcareum</i>	Calcareous Ragged Moss	---	---	S2	NHIC
VASCULAR PLANTS					
<i>Juglans cinerea</i>	Butternut	END	END	S3?	NHIC
<i>Leptogium corticola</i>	Blistered Jellyskin	---	---	S1	NHIC
<i>Pterospora andromedea</i>	Woodland Pinedrops	---	---	S2	NHIC
<i>Platanthera leucophaea</i>	Eastern Prairie Fringed-orchid	END	END	S2	MECP

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<i>Steinia geophana</i>	A Lichen	---	---	S1	NHIC