



**Dawn – Corunna Project:
Environmental Report**

FINAL REPORT

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Sign-off Sheet

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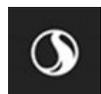
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Executive Summary

Enbridge Gas Inc. (“Enbridge Gas”) has conducted a review of its gas storage and transmission system and has identified the need to replace assets in order to maintain the safe and reliable operation of Enbridge Gas’ systems and continue to meet the firm demands of Enbridge Gas customers. The proposed Dawn-Corunna Project will involve the construction of a new steel pipeline, up to 36-inch diameter, between the Dawn Operations Centre in the Township of Dawn-Euphemia and the Corunna Compressor Station in St. Clair Township. Upgrades to the Dawn Operations Centre and the Corunna Compression Station are required to integrate the two stations. Work will include the decommissioning of compressors and construction of additional piping within the vicinity of the existing stations.

Enbridge Gas has retained Stantec Consulting Ltd. (“Stantec”) to undertake an environmental study of the construction and operation of the natural gas pipeline that meets the intent of the Ontario Energy Board’s (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and facilities in Ontario, 7th Edition* (2016). The Environmental Report (ER), which summarizes the environmental study, will accompany a future Enbridge Gas ‘Leave to Construct’ (LTC) application to the OEB for the Project.

Enbridge Gas is also required to obtain additional permits and approvals from federal, provincial and municipal agencies that have jurisdiction within the Study Area. This ER will serve to support these permit and approval applications.

A route selection process was conducted to determine the best location for the proposed pipeline. Four Alternative Routes were identified within the Study Area boundary and presented during the first of two Virtual Open Houses. No feedback was received at the first Virtual Open House that required adjustments be made to the four proposed Alternative Routes. A qualitative and quantitative evaluation of the Alternative Routes resulted in the selection of a Preliminary Preferred Route, which will be approximately 20 km in length. An extensive consultation program was conducted for the Project to engage federal and provincial agencies, conservation authorities, municipal personnel and elected officials, Indigenous communities, special interest groups, and residents and businesses within 500 metres (m) of the existing route and alternative segments. The consultation program included development and maintenance of a stakeholder contact list which was used to distribute the required notice, newspaper advertisements, agency meetings, two Virtual Open Houses and provision of feedback to those members of the public who had questions, issues, or concerns or positive feedback about the Project. Enbridge Gas is committed to ongoing consultation with interested and potentially affected parties through detailed design and construction and will respond to stakeholder concerns throughout the life of the Project.

The route selection process was undertaken as per the OEB Environmental Guidelines (2016), which identifies the environmental and socio-economic features to take into consideration and the principles to be considered during the route evaluation. Following a comparative evaluation of four Alternative Routes, which considered environmental and socio-economic features and the results of the consultation



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program, a preferred route was identified. The location of the preferred route is shown in Appendix D, Figure D-1.

The potential effects and impacts of the Project on physical, biophysical and socio-economic features have been assessed for the Project. In the opinion of Stantec, the recommended program of supplemental studies, mitigation, protective and contingency measures are considered appropriate to protect the features encountered. Monitoring will assess that mitigation and protective measures have been effective in both the short and long term.

The potential cumulative effects of the Project were assessed by considering development that may begin during construction or that may begin sometime in the future. The Study Area boundary was used to assess potential effects of the Project and other developments on environmental and socio-economic features. As such, the cumulative effects assessment determined that, provided that ongoing consultation, appropriate mitigation and protective measures are implemented, potential cumulative effects will be of low probability and magnitude, short duration, and reversible, positive and are therefore not anticipated to be significant.

With the implementation of the recommendations in the ER, ongoing communication and consultation, and adherence to permit, regulatory and legislative requirements, potential adverse residual environmental and socio-economic impacts of this Project are not anticipated to be significant.



Abbreviations

| | |
|---------|---|
| AA | Archaeological Assessment |
| BGS | Below ground surface |
| COSSARO | Committee on the Status of Species at Risk in Ontario |
| DFO | Fisheries and Oceans Canada |
| EASR | Environmental Activity and Sector Registry |
| ECCC | Environment and Climate Change Canada |
| ECP | Environmental Construction Plan |
| END | Endangered |
| ER | Environmental Report |
| ESA | <i>Endangered Species Act</i> |
| ESC | Erosion and sediment control |
| HADD | Harmful alteration, disruption or destruction |
| HVA | Highly Vulnerable Aquifer |
| IPZ | Intake Protection Zone |
| LTC | Leave to Construct |
| MBCA | <i>Migratory Birds Convention Act</i> |
| MECP | Ministry of the Environment, Conservation and Parks |
| NDMNRF | Ministry of Northern Development, Mines, Natural Resources and Forestry |
| MHSTCI | Ministry of Heritage, Sport, Tourism and Culture Industries |
| MTO | Ministry of Transportation |
| NHIC | Natural Heritage Information Centre |
| OEB | Ontario Energy Board |
| OGS | Ontario Geological Survey |



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|---------|--|
| OHA | <i>Ontario Heritage Act</i> |
| OHT | Ontario Heritage Trust |
| OPCC | Ontario Pipeline Coordinating Committee |
| O. Reg. | Ontario Regulation |
| ORAA | Ontario Reptile and Amphibian Atlas |
| PTTW | Permit to Take Water |
| PSW | Provincially Significant Wetland |
| RoW | Right-of-way |
| SAR | Species at Risk |
| SARA | <i>Species at Risk Act</i> |
| SARO | Species at Risk in Ontario |
| SCRCA | St. Clair Region Conservation Authority |
| SOCC | Species of Conservation Concern |
| SpC | Special Concern |
| Stantec | Stantec Consulting Ltd. |
| THR | Threatened |
| TSSA | Technical Standards and Safety Authority |
| WHPA | Wellhead Protection Area |
| WWR | Water Well Record(s) |



1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Enbridge Gas Inc. (Enbridge Gas) has conducted a review of its gas storage and transmission system and has identified the need to replace assets in order to maintain the safe and reliable operation of Enbridge Gas' systems and continue to meet the firm demands of Enbridge Gas customers.

The proposed Dawn-Corunna Project will involve the construction of a new steel pipeline, up to 36-inch diameter and approximately 20 km in length, between the Dawn Operations Centre in the Township of Dawn-Euphemia and the Corunna Compressor Station in St. Clair Township. Upgrades to the Dawn Operations Centre and the Corunna Compression Station are required to integrate the two stations. Work will include the decommissioning of compressors and construction of additional piping within the of the existing stations.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)* (OEB Environmental Guidelines). The environmental study process included consultation and engagement with landowners, municipalities, agencies, Indigenous communities, and other interested parties through notices, mailouts, a project webpage, meetings, and Virtual Open Houses.

For the remainder of this report, the construction and operation of the proposed pipeline is referred to as 'the project'.

1.2 ENVIRONMENTAL STUDY

1.2.1 Objectives

A multidisciplinary team of environmental planners and scientists from Stantec conducted the environmental study. Enbridge Gas provided environmental support and engineering expertise throughout the study.

The environmental study was completed in accordance with the OEB Environmental Guidelines, as well as relevant federal and provincial environmental guidelines and regulations.



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The principal objective of the environmental study was to outline various environmental mitigation and protection measures for the construction and operation of the project while meeting the intent of the OEB Environmental Guidelines. To meet this objective, the environmental study was prepared to:

- Identify a preferred route that minimizes potential environmental impacts
- Complete a detailed review of environmental features along the preferred route and assess the potential environmental impacts of the project on these features
- Establish mitigation and protective measures that may be used to minimize or eliminate potential environmental impacts of the project
- Develop a consultation program to receive input from interested and potentially affected parties
- Identify any necessary supplemental studies, monitoring and contingency plans

1.2.2 Process

The environmental study was divided into three main phases:

Phase I: Identification and Consultation on the Alternative Routes

The environmental study began with the route generation and selection process. The first step was the development of routing parameters, including delineating the study area, generating routing objectives and identifying environmental and socio-economic constraints and opportunities through a detailed review of available literature and a field reconnaissance. A route evaluation was undertaken to identify environmentally acceptable routes within the study area in consideration of the routing objectives, environmental and socio-economic constraints and opportunities, and constructability.

Phase II: Gather Information and Consultation on the Preliminary Preferred Route

Specific information requests were made to several agencies and stakeholders to assist with identifying environmental features, constraints, the potential for presence of Species at Risk (SAR) and their habitat, and eventually with developing mitigation and protective measures based on predicted effects and potential impacts.

Following the first Virtual Open House, no feedback was received that required adjustments be made to the four proposed Alternative Routes. A quantitative and qualitative evaluation of the Alternative Routes resulted in the selection of a Preliminary Preferred Route (PPR). Feedback was sought on the PPR through newspaper notices, letters, and a second Virtual Open House held from July 19 – August 2, 2021. The gathering of information continued throughout the project.

Following the second Virtual Open House, no feedback was received that required adjustments be made to the PPR.

Phase III: Environmental Report

Phase III involved determining potential environmental and socio-economic impacts and cumulative effects that would result from the project and developing mitigation and protective measures, supplemental studies, monitoring and contingency plans to avoid or reduce potential impacts. The



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environmental study concluded with the preparation of this ER as well as a photomosaic to identify site-specific mitigation and protective measures that will be implemented along the proposed pipeline route (see Appendix F).

1.2.3 The Environmental Report

The environmental study has relied on technically sound and consistently applied procedures that are replicable and transparent. As mentioned above, the study was also undertaken in accordance with the OEB Environmental Guidelines, as well as relevant federal and provincial environmental guidelines and regulations. The ER, which documents the environmental study, will form the foundation for future environmental management activities related to the project.

The ER is organized into the following sections:

- 1.0 Introduction:** provides a description of the project and the environmental study
- 2.0 Route Selection:** provides an overview of the pipeline route evaluation and selection process
- 3.0 Consultation Program:** describes the consultation program
- 4.0 Impact Identification, Assessment and Mitigation:** describes the existing conditions, predicts potential effects and impacts, recommends supplemental studies, mitigation and protective measures, and considers net impacts
- 5.0 Cumulative Effects Assessment:** provides an analysis of potential cumulative effects associated with the proposed project
- 6.0 Monitoring and Contingency Plans:** describes monitoring and contingency plans to address potential environmental impacts of the proposed project
- 7.0 Conclusion:** provides a discussion and consideration of the potential environmental impacts associated with the proposed project

The ER also includes references, and appendices for documentation.

1.2.4 The OEB Regulatory Process

Once complete, the ER is circulated to affected municipalities, conservation authorities and to the Ontario Pipeline Coordinating Committee (OPCC) for their review and comment. The OPCC is an inter-ministerial committee that includes provincial government ministries, boards, and authorities with potential interest in the construction and operation of hydrocarbon transmission and storage facilities. The ER is also circulated to landowners, Indigenous communities, and other interested parties. The ER will accompany a future Enbridge Gas 'Leave-to-Construct' (LTC) application to the OEB for the proposed project.

Upon receiving the application, the OEB will hold a public hearing. Communication about the hearing will include notices in local newspapers and letters to directly affected landowners, both of which will outline how the general public and landowners can get involved with the hearing process. If after the public



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hearing the OEB finds the project is in the public interest it will approve construction of the project. The OEB typically attaches conditions to approved projects. Enbridge Gas must comply with these conditions at all stages of the project, including during construction and site restoration.

1.2.5 Additional Regulatory Processes

Enbridge Gas will also be required to obtain additional environmental permits, approvals and notifications from federal, provincial and municipal agencies as outlined in Table 1.1 below. This ER will serve to support these permit and approval applications and notifications.



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Table 1.1: Summary of Potential Environmental Permit and Approval Requirements

| Permit/Approval Name | Administering Agency | Description |
|---|-----------------------------------|--|
| FEDERAL PERMITS AND APPROVALS | | |
| Clearing of Vegetation under the <i>Migratory Bird Convention Act</i> (MBCA) (1994) | Environment Canada | No permit is necessary; however, precautions need to be taken so that no breeding birds or their nests are harmed or destroyed during the bird nesting season. Nest sweeps will be required at a maximum of 7 days prior to vegetation removal during the MBCA bird nesting season (April 1 to August 31). |
| Review and authorization under the <i>Fisheries Act</i> (1985) | Fisheries and Oceans Canada (DFO) | DFO review and possible Fisheries Act authorization is required at watercourse crossing containing species protected under the Species at Risk Act (SARA) (2002). The DFO may authorize activities that have the potential to affect fish or mussel species protected under the SARA (2002). The Fisheries Act (R.S.C., 1985, c. F-14) prohibits activities that result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat (s.35[1]) unless authorized by the Minister of Fisheries and Oceans Canada (DFO). The Species at Risk Act (S.C. 2002, c. 29), prohibits the killing, harming, harassing, capturing or taking of a species (s.32) or damaging or destroying the residence of a species (s.33) that is listed as extirpated, endangered or threatened. For federally regulated aquatic species, these activities may be permitted through a Species at Risk Act (SARA) Permit, issued by DFO. The above prohibitions apply to activities that occur in or near waterbodies that support fish and fish habitat and/or aquatic species at risk protected under the SARA. |
| Permitting under the SARA (2002) | DFO | A SARA permit is required to capture, handle and relocate SARA Schedule 1 fish or mussel species during construction. As indicated in Section 32 (1) of the SARA (2002), “No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.” As indicated in Section 73 (1) of the SARA (2002), “The competent minister may enter into an agreement with a person, or issue a permit to a person, authorizing the person to engage in an activity affecting a listed wildlife species, any part of its critical habitat or the residences of its individuals.” |



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Table 1.1: Summary of Potential Environmental Permit and Approval Requirements

| Permit/Approval Name | Administering Agency | Description |
|---|--|---|
| PROVINCIAL PERMITS AND APPROVALS | | |
| Development Permits under <i>Ontario Regulations 171/06</i> (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per the <i>Conservation Authorities Act</i> (1990) | St. Clair Region Conservation Authority (SCRCA) | Required for works within SCRCA Regulated Areas, including shorelines, watercourses, wetlands and hazardous lands (flooding and erosion hazards, and unstable soils and bedrock). |
| Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR) (surface and groundwater) under the <i>Ontario Water Resources Act</i> (1990) | Ministry of the Environment, Conservation and Parks (MECP) | Under Ontario Regulation (O. Reg.) 64/16 and O. Reg. 63/16, the MECP requires a PTTW for dewatering in excess of 400,000 L/day, and an EASR for dewatering between 50,000 and 400,000 L/day. This can include trench dewatering and taking water for hydrostatic testing from a pond, lake, etc. There are some exceptions for surface water takings where active or passive surface water diversions occur such that all water taken is returned to within another portion of the same surface water feature. |
| Permitting or registration under the <i>Endangered Species Act</i> (ESA) (2007) | MECP | An ESA permit or Registration is required for activities that could impact species protected under the ESA. Consultation will occur with the MECP to determine ESA permitting requirements. As indicated in Section 9 (1) a of the ESA (2007), “No person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species.” As indicated in Section 17 (1), “the Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10.” |
| Archaeological clearance under the <i>Ontario Heritage Act</i> (OHA) | Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) | A Stage 1-2 archaeological assessment (AA) is required along the Right-of-Way (RoW) and temporary land use areas to identify areas of archaeological potential prior to any ground disturbances and/or site alterations. Depending on the results of the Stage 1-2 AA, Stage 3 and 4 AA's may be required. The completed archaeological assessment reports are forwarded to the MHSTCI for review and comment. |
| Review of Built Heritage and Cultural Landscape under the OHA | MHSTCI | A Heritage Overview Study will be completed to determine the presence of built heritage and cultural landscapes. If identified, a Heritage Impact Assessment is required to determine the effects of the project on heritage resources and recommend mitigation measures, if necessary. |



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Table 1.1: Summary of Potential Environmental Permit and Approval Requirements

| Permit/Approval Name | Administering Agency | Description |
|--|---------------------------|--|
| MUNICIPAL PERMITS AND APPROVALS | | |
| Noise By-Law No. 44 of 2014 | St. Clair Township | Project activities should adhere to the local noise by-law. |
| N/A | Township of Dawn-Euphemia | During the consultation process and preparation of the ER, no applicable by-laws for the Township of Dawn-Euphemia were noted; however, prior to the onset construction activities an additional review will be completed to review any by-laws that may be applicable to the Project. |
| By-Law No. 13 of 2008 | County of Lambton | Prior to the placement, reconstruction or alteration of any private pipeline or related plant/appurtenance (gas, sewer, watermain, etc.) under, along or across the County road allowance, permission must be obtained from the Public Works Department in accordance with By-Law 13-2008. Each application submitted to the Public Works Department must be accompanied by the appropriate application and road use fees (Schedule A of the By-Law). |
| By-Law No. 88 of 1998 | | An Oversize and Overweight Permit is required for the transportation of goods not conforming to the standards detailed in the <i>Highway Traffic Act</i> (R.S.O. 1990, Chapter 198). |

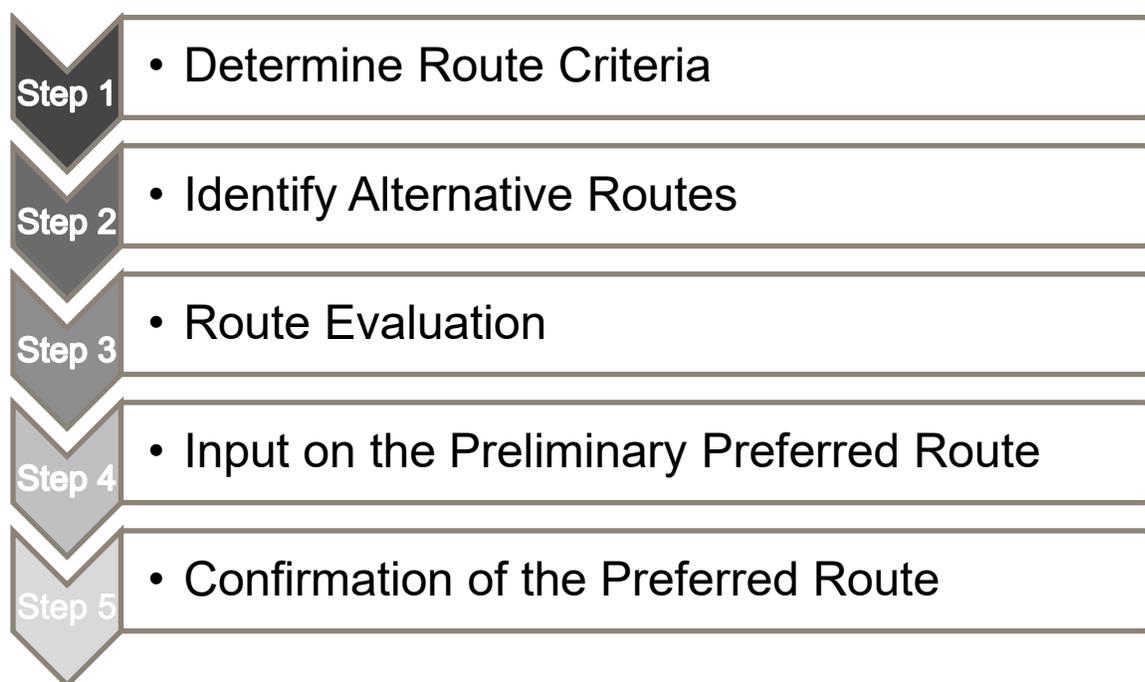


2.0 ROUTE SELECTION

2.1 THE PROCESS

The route evaluation and selection process was undertaken in accordance with the OEB Environmental Guidelines which identify the environmental and socio-economic features, and the routing principles, to be considered. The preferred pipeline route for the proposed Project was confirmed through a five-step process, illustrated in Figure 2-1 below.

Figure 2.1: Route Evaluation Methodology



2.2 ROUTING PARAMETERS

2.2.1 Study Area

The study area is the area within which direct interactions with the socio-economic and natural environment could occur and allows for a reasonable number of alternative routes to be considered. It is within this area that desktop information on socio-economic and environmental features has been collected.

The Study Area is rectangular in shape and encompasses an area of approximately 253.83 km². The terminal points of the proposed pipeline roughly defined the northern and southern study area boundaries. The location of the northern tie-in is the existing Enbridge Gas Corunna Compressor Station.



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The southern terminal point tie-in is the existing Enbridge Gas Dawn Compressor Station, with an extended buffer of approximately 1.5 km added to the south of the Corunna Compressor Station to allow for potential Alternative Routes to travel westbound along Bentpath Line. The eastern and western boundary line or boundary extents of the Study Area was determined by applying an approximate buffer of 2 km to the west of the Corunna Compressor Station and an approximate buffer of 2 km to the east of the Dawn Compressor Station. The eastern extent of the Study Area extended north-south along Cuthbert Road, and the western extent of the Study Area extended north-south to the west of Indian Creek Road along an existing Hydro One Networks Inc. (HONI) transmission corridor.

The study area is shown on Figure 1, Appendix A.

2.3 STEP 1: DETERMINE ROUTE CRITERIA

2.3.1 Routing Objectives

The overarching objective in the route evaluation and selection process is that the selected route presents the least potential for adverse environmental and socio-economic impacts. The following principles support that objective:

1. Routes should follow a reasonably direct path between end-points to reduce length; in general, a shorter route will help eliminate or minimize the extent of most potential environmental and socio-economic impacts.
2. Routes should avoid sensitive environmental and socio-economic features wherever practicable; where such features cannot be avoided, routes should be located to minimize potential impacts.
3. Existing linear infrastructure should be used or paralleled to the greatest extent feasible to minimize impacts on previously undisturbed environmental and socio-economic features and to limit constraints on future land development.
4. Where new easements are required, existing lot and property lines should be followed to the extent feasible to avoid deviations into previously undisturbed environmental and socio-economic features.

2.3.2 Environmental and Socio-Economic Opportunities and Constraints

Chapter 4 of the OEB Environmental Guidelines (2016), 'Route or Site Selection', outlines environmental and socio-economic features that should be considered during the route evaluation and selection process. Features in the study area were considered as either pipeline routing opportunities or constraints.

Pipeline routing opportunities are existing features which provide a potential location for the alignment of a pipeline to avoid or minimize unnecessary environmental or socio-economic impacts. Pipeline routing constraints are existing features that meet the following criteria:



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- Site-specific mitigation measures would be required to reduce potential effects
- The feature has been selected or designated for protection
- The feature has been recognized through local, regional, provincial, or federal policy, plan, or statute, or is otherwise valued as an environmental or socio-economic resource

Constraints and opportunities were mapped in a Geographic Information System (GIS) database from existing government databases, including base data and environmental data provided through the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNR's) Land Information Ontario (LIO) data warehouse. LIO is the province's central repository for authoritative digital data, from the MNR itself as well as other governmental departments and agencies.

After creating a GIS database of pipeline corridor opportunities and constraints, a windshield survey was undertaken by personnel of Stantec Consulting Ltd. (Stantec) on April 16, 2021. This windshield survey both verified the features that had been mapped and considered whether there were any additional features that were not identified in the records review but that nonetheless required mapping.

In the study area, three pipeline routing opportunities (as defined above) are present: two existing Enbridge Gas pipeline easements and a hydroelectric corridor operated by HONI. In the study area, a variety of pipeline routing constraints (as defined above) are present: developed areas (communities, homes, agricultural operations), topography (i.e., slope), roads and environmental features such as watercourses, wetlands and wooded areas.

2.4 STEP 2: IDENTIFY ALTERNATIVE ROUTES

As a result of mapping exercises, field reconnaissance and the experience of Enbridge Gas and Stantec four Alternative Routes were developed.

- Alternative Route 1 parallels existing natural gas pipelines that extend from the Dawn Compressor Station and travel northwest to the Corunna Compressor Station.
- Alternative Route 2 also parallels existing natural gas pipelines that extend from the Dawn Compressor Station and travel northwest to the Corunna Compressor Station.
- Alternative Route 3 parallels existing natural gas pipelines from the Dawn Compressor Station extending northwest until roughly Bickford Line where the route then travels due north until it reaches the Corunna Compressor Station.
- Alternative Route 4 parallels an existing natural gas pipeline and Bentpath Line from Dawn Compressor Station it extends west to the HONI transmission corridor where the route then travels due north to the Corunna Compressor Station.



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During field reconnaissance conducted by Enbridge Gas in June 2021, a section of the existing pipeline easement in the area of Stanley Line and Black Creek, which is traversed by Alternative Routes 1 and 2, was assessed. This area was noted to be constrained by watercourses, wooded areas and steep watercourse banks. As a result, a micro route analysis was undertaken along Alternative Route 1 and Alternative Route 2 from just south of Stanley Line, extending northwest until the intersection with Bickford Line. Five (5) micro-routes were identified:

- Micro-route 1 parallels an existing natural gas pipeline and crosses Black Creek once and the Black Creek Tributary once.
- Micro-route 2 also parallels an existing natural gas pipeline and has four watercourse crossings: one crossing of Black Creek and three crossings of the Black Creek Tributary.
- Micro-route 3 turns away from the existing pipeline and follows Stanley Line west slightly and then turns to the northwest and crosses Black Creek once and the Black Creek Tributary twice.
- Micro-route 4 turns away from the existing pipeline follows a property lot line south of Stanley Line, turning north and crossing Black Creek once.
- Micro-route 5 also turns away from the existing pipeline and travels to the west and then due north to cross Black Creek and an unmapped intermittent drain.

The four Alternative Routes and five micro-routes are shown on Figure 2, Appendix A.

2.5 STEP 3: ROUTE EVALUATION

2.5.1 Alternative Route Evaluation Methodology

The four Alternative Routes were subject to a comparative evaluation. The goal of the comparative evaluation was to determine the potential environmental and socio-economic effects of constructing and operating each Alternative Route, to aid in determining which route was preferred from an environmental perspective.

The four Alternative Routes were evaluated by identifying features along the proposed Alternative Routes with select environmental and socio-economic base data acquired from relevant published literature, maps and digital data. An evaluation corridor of 50 m on either side of the pipeline was applied to each of the four Alternative Routes. Categories of assessed features, listed alphabetically, include:

- **Agricultural:** length of prime agricultural land and tile drainage traversed.
- **Aquatic:** conservation authority regulated lands (hectares within 30 m), number of mapped watercourses and/or drain crossings, number of watercourses with identified Species at Risk (SAR), and provincially evaluated wetlands.
- **Archaeology:** potential for archaeological resources and areas of archaeological potential.
- **Groundwater Resources:** Number of water wells (i.e., domestic and livestock wells) within 30 m.
- **Route Characteristics:** Length (m)
- **Socio-Economic:** Number of road crossings, petroleum wells within 50 m.
- **Terrestrial:** Areas of Natural Scientific Interest (ANSI) and wooded area (hectares within 30 m).



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Table 2.1: Alternative Route Comparative Evaluation

| Feature | Alternative Route 1 | Alternative Route 2 | Alternative Route 3 | Alternative Route 4 |
|---|---------------------|---------------------|---------------------|---------------------|
| Agricultural | | | | |
| Prime Agricultural Land (ha within corridor) | 184 | 194 | 236 | 281 |
| Random Tile Drainage (ha within corridor) | 50.72 | 50.21 | 82.81 | 73.46 |
| Systematic Tile Drainage (ha within corridor) | 109.88 | 119.17 | 105.12 | 162.51 |
| Aquatic | | | | |
| Conservation Authority Regulated Lands (ha within corridor) | 145.31 | 125.46 | 108.05 | 105.06 |
| Watercourse / Drain Crossings | 22 | 20 | 19 | 20 |
| Watercourses with Identified SAR | 9 | 9 | 11 | 12 |
| Provincially Evaluated Wetlands (ha within corridor) | 0 | 0 | 2.03 | 1.71 |
| Groundwater Resources | | | | |
| Water wells | 7 | 6 | 4 | 1 |
| Archaeology | | | | |
| Archaeological Sites (within 100 m) | 0 | 0 | 2 | 2 |
| Route Characteristics | | | | |
| Length (km) | 19.24 | 20.21 | 24.38 | 28.61 |
| Socio-Economic | | | | |
| Road Crossings | 14 | 14 | 15 | 14 |
| Petroleum wells (within 50 m) | 6 | 6 | 3 | 8 |
| Terrestrial | | | | |
| Wooded Areas (ha within corridor) | 5.87 | 9.61 | 12.76 | 14.01 |

Alternative Routes 1 and 2 have the potential to overlap adjacent pipeline easements for the full route from Dawn Transmission Station and Corunna Transmission Station. To construct either Alternative Routes 3 or Alternative Route 4, significant sections of previously undisturbed lands have the potential to be impacted. For this reason, Alternative Routes 3 and 4 were dropped from consideration. Through the comparative evaluation, and the ability to overlap adjacent pipeline easements, Alternative Route 1 and Alternative Route 2 were found to both be environmentally acceptable.

Alternative Route 1 was preferred overall due to pipeline length, smaller total area of wooded area crossed, fewest road crossings, fewest number of watercourses with identified SAR crossed, and the smallest area of provincially evaluated wetland crossed. A field visit by Enbridge Gas in the summer of 2021 confirmed that from a construction and engineering aspect, it was feasible to construct Alternative Route 1. Alternative Route 1 was selected as the Preliminary Preferred Route (PPR).



2.5.2 Micro-Route Evaluation Methodology

In the area of Stanley Line and Black Creek contains several pipeline constraints including watercourses with recorded SAR, woodlots, and variations in the topography. For this reason, five micro-routes were developed, as discussed in Section 2.4. Ecological field assessments were completed for each of the five proposed micro-routes on June 21, 2021. The focus of the ecological assessments was to document fish and mussel habitat at the proposed crossings and to confirm and note the presence of aquatic species at risk (SAR) or their preferred and critical habitats in Black Creek and the Black Creek Tributary, and to delineate vegetation communities along the proposed routes.

If the crossing can be completed via horizontal directional drill (HDD) micro-route 1 was found to be the preferred. Otherwise, from an ecological perspective and when associated topographical considerations are made, micro-route 5 is also a preferred option. The following opportunities were noted regarding Micro-route 5:

- Contains the fewest watercourse crossings
- Limited construction challenges from side slopes and steep embankment in close proximity to existing pipelines
- Reduction in area of woodland impacted compared to the other micro-routes, and
- Anticipated cost savings compared to constructing the other micro-routes.

2.6 STEP 4: INPUT ON THE PRELIMINARY PREFERRED ROUTE

Input on the Alternative Routes and the PPR were sought through consultation (see Section 3). No input was received that objected to the proposed PPR, and as such the PPR was confirmed as the Preferred Route (PR), including micro-route 5 (Figure 4, Appendix A).

The PR is shown on Figure 3, Appendix A.

2.7 STEP 5: CONFIRMATION OF THE PREFERRED ROUTE

The preferred route is currently illustrated within a general location. Enbridge Gas will undertake detailed design to determine the exact location of the running line, permanent easement, temporary land use requirements and road/watercourse crossing methods. Detailed design will also be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies. In general, this micrositing exercise will seek to avoid socio-economic features and sensitive natural features to the extent practicable.



3.0 CONSULTATION PROGRAM

3.1 OBJECTIVES

Consultation is an important component of the *OEB Environmental Guidelines, 7th Edition* (2016). Consultation is the process of identifying interested and potentially affected parties and informing them about the Project, soliciting information about their values and local environmental and socio-economic circumstances, and receiving input into key Project decisions before those decisions are finalized.

The consultation program for this Project included the following objectives:

- Identify interested and potentially affected parties early in the process
- Provide a forum for the identification of issues
- Identify how input will be used in the planning stages of the Project
- Summarize issues for resolution and resolve as many issues as feasible
- Revise the program to meet the needs of those being consulted, as feasible
- Develop a meaningful yet safe forum/mode of engagement which considers the need to maintain the physical distancing requirements set out by the Government of Canada and the Province of Ontario due to COVID-19
- Through the established (meaningful, yet safe) modes of engagement, inform and educate interested parties about the nature of the Project, potential impacts, proposed mitigation measures and how to participate in the consultation program in a clear, concise, relevant and timely manner
- Develop a framework for ongoing communication during the construction and operation phase of the Project

3.2 IDENTIFYING INTERESTED AND POTENTIALLY AFFECTED PARTIES

The identification of interested and potentially affected parties was undertaken using a variety of sources, including the OEB's OPCC Members List, the MECP's Environmental Assessment Government Review Team Master Distribution List, and the experience of Enbridge Gas and Stantec. Indigenous communities were identified through provision of a Project Summary to the Ministry of Energy, Northern Development and Mines (MENDM) in February 2021 (see Appendix B1).

In addition, the parties listed below were among those considered when developing the initial stakeholder contact lists:

- Federal and provincial agencies and authorities, including the SCRCA and members of the OPCC
- Municipal personnel
- Special interest groups
- Indigenous communities
- Directly affected and adjacent landowners



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The initial contact list was updated as the environmental study progressed because of changes in personnel, correspondence received and attendees at the Virtual Open Houses. The final Agency and Indigenous Contact List is located in Appendix B1.

Directly affected and adjacent landowners were identified by LandSolutions for notification of the project and Virtual Open House purposes. Enbridge Gas also undertook direct consultation with landowners and elected officials. Members of the public who provided feedback were documented in a Landowner/Resident Contact List.

3.3 COMMUNICATION METHODS

3.3.1 Newspaper Notices

A Notice of Commencement and Virtual Open House was published on April 27th, 2021, in the Sarnia Observer and on April 29th, 2021, in the Sarnia This Week. The Notice introduced and described the project, provided a map, noted the format and dates of the Virtual Open House and listed project contact information.

A Notice of Second Virtual Open House was published on July 13th, 2021, in the Sarnia Observer and on July 15th, 2021, in the Sarnia This Week. The Notice described the project, provided a map, noted the format and dates of the Virtual Open House and listed project contact information.

Copies of tear sheets from the newspaper notices are located in Appendix B2.

3.3.2 Letters and Emails

3.3.2.1 Notice of Commencement and Virtual Open House

Letters were sent via email to all parties identified on the OPCC, Agency and Indigenous Contact List on April 20, 2021, to provide information on the project, the Alternative Routes, and on the Virtual Open House. Letters were mailed to landowners located within the boundary of the study area and along the Alternative Routes via Canada Post regular mail on April 19, 2021. Appended to the letters and emails was a map of the study area and Alternative Routes.

Generic copies of the letters noted above are located in Appendix B3.

3.3.2.2 Notice of Second Virtual Open House

Letters were sent via email to all parties identified on the OPCC, Agency and Indigenous Contact List on July 12, 2021, to provide information on the project, the PPR, and the second Virtual Open House. Letters were mailed to landowners whose property was located on or adjacent to the PPR, and to the landowners whose property was located along the previously identified Alternative Routes via Canada Post regular mail on July 5, 2021. Appended to the letters and emails was a map of the PPR.

Generic copies of the letters noted above are located in Appendix B3.



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3.3.3 Social Media

The first and second Virtual Open House were advertised on the Enbridge Gas Twitter and Facebook pages. Copies of these social media posts are located in Appendix B4.

3.3.4 Virtual Open House – Presentation Slides, Interactive Map and Exit Questionnaire

Presentation slides were developed for the Virtual Open House. The presentation slides provided information on the project, the regulatory process, the Alternative Routes, anticipated environmental and socio-economic impacts and mitigation, and next steps. A voiceover recording was paired with the presentation slides. Accommodations were provided to support individuals participating in the Virtual Open Houses such as printing and mailing hard copies of the questionnaire, presentation slides and script, including pre-paid postage to submit the completed questionnaire, providing assistance in completing the questionnaire, and a Frequently Asked Questions document.

A link to an exit questionnaire and an interactive map were provided in the presentation slides. A downloadable version of the presentation slides, script and the exit questionnaire were provided in a “Resources” tab in the presentation slides. The exit questionnaire requested feedback on potential impacts, the Alternative Routes, and the content of the Virtual Open House. The interactive map allowed Virtual Open House attendees to view the Alternative Routes and study area on a web-based map. A search function was made available on the interactive map to locate a specific address, and to review natural environment map layers such as waterways and wooded areas.

Copies of the first Virtual Open House presentation slides, presentation script, the Frequently Asked Questions document and the submitted exit questionnaires are in Appendix B4.

Presentation slides were developed for the second Virtual Open House. The presentation slides provided information on the project, the regulatory process, the route selection process, the preliminary preferred route, anticipated environmental and socio-economic impacts and mitigation, and next steps. A voiceover recording was paired with the presentation slides.

As with the first Virtual Open House, a link to an exit questionnaire and an interactive map were provided in the presentation slides. The exit questionnaire requested feedback on the potential impacts, the Alternative Routes and the content of the second Virtual Open House. The interactive map allowed the Virtual Open House attendees to view the PPR and study area on a web-based map.

Copies of the second Virtual Open House presentation slides, presentation script and the submitted exit questionnaires are in Appendix B4.



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3.3.5 Project Webpage

A project webpage was developed using the ArcGIS StoryMaps platform. The webpage contained a Resources tab that contained the presentation slides, the exit questionnaire and the presentation voiceover script. The webpage main page contained information on the project, the regulatory process and Enbridge Gas' commitment to the environment. The project webpage was communicated to interested and potentially affected parties on the newspaper notices, letters and emails.

3.4 CONSULTATION EVENTS

3.4.1 Meetings

Meetings regarding the Project have or will occur between Enbridge Gas, Municipalities, SCRCA, key stakeholders, Indigenous communities and directly impacted landowners, and will continue as the project progresses towards detailed design and construction.

3.4.2 Virtual Open Houses

Due to physical distancing requirements set out by the Government of Canada and the Province of Ontario due to the COVID-19 pandemic, Virtual Open Houses were hosted online. The first Virtual Open House was accessible from May 3 to May 19, 2021, and the second Virtual Open House was accessible from July 19 – August 2, 2021. These two-week time periods were selected to allow agencies, Indigenous communities, landowners, residents and other stakeholders ample opportunity to review the project information and provide input.

A project email address and project phone number were provided in the Virtual Open House for attendees to ask questions and leave comments. For the first Virtual Open House, there were: 147 visits to the ArcGIS StoryMaps webpage, with 40 visits to the presentation, two (2) questionnaires submitted via the questionnaire link in the presentation, and 1 (one) questionnaire submitted via the project email address. For the second Virtual Open House, there were: 74 visits to the ArcGIS StoryMaps webpage, 16 visits to the presentation, and one (1) questionnaire submitted via the questionnaire link in the presentation.

Redacted copies of the completed exit questionnaires are included in Appendix B5.

3.5 INPUT RECEIVED

The consultation and engagement program allowed interested or potentially affected parties to provide input into the Project. Input was evaluated and integrated into the Project. The following sections summarize key input received.

Comment-response summary tables and a copy of all written comments and responses are provided in Appendix B5.



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3.5.1 Public Input

Two (2) comments were received from the public at the time of writing this ER. The main areas of concern included within the comment were as follows:

- Potential environmental impacts from construction of the Project.
- The size of the existing pipeline

3.5.2 Agency Input

Eleven (11) comments were received from agencies at the time of writing this ER:

- The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) provided information to guide identification and assessment of natural features and resources as required by applicable policies and legislation.
- The Impact Assessment Agency of Canada (IAAC) provided information to determine if the proposed project is described under the regulations of the Impact Assessment Act.
- The MENDM provided a Letter of Delegation in response to a request to determine the procedural aspects of the Duty to Consult.
- The MHSTCI provided information to guide identification and assessment of built heritage resources and cultural heritage landscapes and cultural heritage resources within the Study Area.
- The MECP provided information on submitting notices of commencement for streamlined EAs.
- The Source Protection Program Branch of the MECP shared that natural gas pipelines are not identified as a threat to drinking water sources under the Clean Water Act, 2006. MECP also provided information to guide identification and assessment of impacts to drinking water, aquifers, and Intake-Protection Zones.
- The Technical Standards and Safety Authority requested confirmation that Enbridge Gas will submit an Application for Review of Pipeline Project to the OEB.
- HONI confirmed that existing high voltage transmission facilities are present within the Study Area and noted preference for Alternative Route 1 and Alternative Route 2.
- SCRCA provided a link to their online mapping which includes natural heritage features and areas regulated by SCRCA under O.Reg. 171/06.

3.5.3 Municipal Input

Meetings were held in September 2021 with St. Clair Township, Dawn Euphemia, and Lambton County staff and Enbridge Gas staff to discuss the project. Discussion topics included pipeline routing, drainage, construction yard locations, traffic control, and approach to construction. In all cases, Enbridge Gas staff and respective Municipal staff members will continue to exchange information as project planning continues.

3.5.4 Indigenous Input

Enbridge Gas is committed to creating processes that support meaningful engagement with potentially affected Indigenous groups (First Nations and Métis). Enbridge Gas works to build an understanding of project related interests, ensure regulatory requirements are met, mitigate or avoid project-related impacts on Aboriginal interests including rights, and provide mutually beneficial opportunities where possible.



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On January 20, 2021, Enbridge Gas provided the potentially affected Indigenous communities with an initial notification of the Project. This was followed with a formal letter of notification on April 13, 2021. Stantec, acting on behalf of Enbridge Gas, sent out the Notice of Commencement on April 20, 2021, which provided the details of the Virtual Open House. Information on the second open house was sent to the Indigenous communities on July 8, 2021, by Stantec.

On August 17, 2021, Enbridge Gas met virtually with Aamjiwnaang First Nation (“AFN”) to discuss the route selection for the Project. The Enbridge Gas representative, using slides from the Virtual Open House, reviewed the four routes that were initially selected and explained how the preferred route was chosen. The AFN representatives had questions around the water crossings - how many there would be and environmental restoration of the site following construction. The Enbridge Gas representatives advised that a copy of the Environmental Report would be circulated to the Indigenous Communities once it has been completed and advised that a meeting would be set up to discuss the findings. The Enbridge Gas representative also invited AFN to have monitors from their community participate in the archaeology and natural heritage surveys that will be occurring in the fall 2021.

Enbridge Gas will continue to conduct its Indigenous consultation through phone calls, virtual and in-person meetings, and email communications. During these engagement activities, Enbridge Gas representatives will provide an overview of the Project, respond to questions and concerns, and address any interests or concerns expressed by Indigenous communities to appropriately mitigate any Project-related impacts. In order to accurately document Indigenous engagement activities and ensure follow-up, applicable supporting documents are tracked using a database. The Indigenous Consultation report, which includes the comment-response summary table and corresponding comment records, will be submitted to the OEB upon the filing of the project application.

3.5.5 Interest Group Input

No comments were received from interest groups at the time of writing this ER.

3.6 REFINEMENTS BASED ON INPUT

At each stage of the consultation program input received was compiled, reviewed, and incorporated into the environmental study process. Responses were provided, as applicable, to questions and comments received.

Enbridge Gas has committed to on-going consultation with directly affected and interested parties through detailed design and construction and will continue to respond to concerns through the life of the Project. Input was reviewed and considered during the identification of potential impacts and determination of mitigation and protective measures.



4.0 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION

4.1 STUDY AREA

A Study Area is the area within which direct interactions with the socio-economic and natural environment could occur. For the purposes of the environmental study, the boundary of the Study Area was selected to be rectangular in shape and encompass the Enbridge Gas Dawn Compressor Station to the south-east and the Enbridge Gas Corunna Compressor Station to the north-west (see Figure 1, Appendix A).

The boundary line or terminal northern and southern end of the Study Area was determined by the pipeline's terminal point tie-in to the existing Corunna Compressor Station on Tecumseh Road and the tie-in to the existing Dawn Compressor Station on Bentpath Line. The eastern and western boundary line or boundary extents of the Study Area was determined by applying an approximate buffer of 2 km to the west of the Corunna Compressor Station and an approximate buffer of 2 km to the east of the Dawn Compressor Station.

4.2 DATA SOURCES

Information requests were made to agencies and municipalities. The information collected assisted in identifying environmental features located on and adjacent to the Project. Where agencies requested that information be kept confidential, such as archaeological sites, such information has been withheld from the report or mapped in such a way that specific site locations cannot be determined.

The existing conditions maps (Appendix C) have been generated from base mapping provided from Enbridge Gas (2010) and data obtained from GeoHub (Ontario GeoHub, MNRF, 2020). Conservation Authority regulated area data was obtained from SCRCA. Scales have been adjusted from the original source to better represent the features mapped. Stantec has digitally reproduced features added to the base maps. Additional mapping sources are identified on the respective map, and in the references.

For the socio-economic elements of the assessment, the most recent economy and employment statistics are provided in the 2016 Census of Population (Statistics Canada 2017). The selected census divisions included Ontario, Lambton County, and the Townships of Dawn-Euphemia and St. Clair, which are located within Lambton County (Statistics Canada, 2017). These census divisions were selected to consider the County as a whole, which includes numbers for both Dawn-Euphemia and St. Clair townships, as well as the City of Sarnia, and the individual townships where the Project will occur. The effects of the project are likely to be experienced differently in the rural environment where localized Project impacts are likely to be experienced directly by landowners, and the urban location where the wider economic and infrastructure and impacts are likely to be experienced.



4.3 PHYSICAL FEATURES

4.3.1 Bedrock Geology and Drift Thickness

The bedrock geology of the Study Area is Upper Devonian-aged shale, predominantly of the Kettle Point Formation. Port Lambton Group shale is also found in the northwestern area of the Study Area. (OGS, 2011). A map of bedrock geology is provided in Appendix C, Figure 1.

To determine the general depth from the soil surface to the bedrock, drift thickness (also referred to as overburden) was reviewed and results indicate that, in the Study Area, the layer of overburden ranges from <15 m to <75 m. As shown on Figure 2 (Appendix C), drift thickness increases along the preferred route from the southeast near the Dawn Compressor Station to the northwest toward the Corunna Compressor Station.

A review of available Water Well Records (WWR) within the Study Area reveals there are 668 WWR. These WWR indicate that the depth to bedrock is between about 18 to 64 m below ground surface (BGS) (MECP, 2020a).

4.3.2 Physiography and Surficial Geology

The Study Area is located in the St. Clair Clay Plains physiographic region of southern Ontario, which is a region characterized as relatively flat, reworked till plains that were deposited and then over-ridden by subsequent glaciation. See Figure 3, Appendix C (Chapman and Putnam 1984). These beveled till plains were subsequently smoothed by shallow deposits of lacustrine clay laid down by glacial lakes Whittlesey and Warren (Chapman and Putnam 1984).

As shown in surficial geology mapping (Figure 4, Appendix C), the Study Area is predominately underlain by massive well laminated fine-textured glaciolacustrine deposits and glaciolacustrine-derived silty to clayey till. Modern and older alluvial deposits are also encountered in association with several creeks and tributaries that flow into the North Sydenham River.

4.3.3 Groundwater

With the exception of 2 small areas near Black Creek Line and Waubuno Road and near Brigden Road south of Oil Springs Line, there are no highly vulnerable aquifers (HVA) within the Study Area (MECP, 2020b). With the exception of a few areas in the northern half of the Study Area, with just one area near the Corunna Compressor Station being crossed by the proposed pipeline, there are no significant groundwater recharge areas within the Study Area. These few areas have a groundwater vulnerability score of 2. Based on the general fine-grained deposits that are characteristic of the physiographic region of the Study Area, these are the only areas that have a groundwater vulnerability score within the Study Area (MECP, 2020b).



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Mapping by the MECP (MECP, 2020b) indicates there are no Intake Protection Zones (IPZ's) or Wellhead Protection Areas (WPHA's) identified in the Study Area. Within St. Clair Region, all municipal drinking water intakes use surface water from Lake Huron or in Wallaceburg from the Chenal Ecarte intake at the Wallaceburg Water Treatment Plant (Thames-Sydenham and Region Source Protection Committee, 2015). IPZ's are, therefore, concentrated along Lake Huron near Sarnia and in Wallaceburg on lands adjacent to the intake points that are greater than 15 km from the Study Area. The closest WPHA is in Ridgely which is located about 40 km southeast of the Study Area. The Study Area includes an Event Based Area (EBA) with a vulnerability score of 0 (not significantly vulnerable). Based on this vulnerability score, under the *Clean Water Act* (2006) list of prescribed drinking water threats, there are no activities that would result in a significant chemical and/or pathogen threat to the surface water supply (MECP, 2020b).

A figure of nearby domestic wells is provided in Appendix C, Figure 5. MECP WWR indicated that of the 668 WWR within the Study Area, the primary designation of use is for domestic or livestock. WWR marked as public or municipal are interpreted to be domestic. WWR reported a range in depths for these wells from 12.5 m BGS to 88.1 m BGS with a reported static water level range from about 1 m BGS to 37 m BGS.

Regional groundwater flow is generally interpreted to be towards the Great Lakes, with local groundwater flow conditions impacted by surface water features, primarily draining into Lake St. Clair.

4.3.4 Aggregates and Petroleum Resources

A review of the County of Lambton Official Plan (2019) and the Township of St. Clair Official Plan (2005) indicates that there are no aggregate mineral resources located within the Study Area.

There are oil and gas wells within the Study Area, primarily to the immediate south and east of the Corunna Compressor Station and to the north of the Dawn Compressor Station. There are a total of six (6) oil and gas wells within 50 m of the PPR: four (4) of which are noted as 'abandoned', one (1) as 'active' and one (1) as 'unknown'. The PR crosses an active natural gas storage pool to the immediate southeast of the Corunna Compressor Station.

A map of the aggregates and petroleum pools is in Appendix C, Figure 6.

4.3.5 Soil and Soil Capability

There are several soil types identified within the Study Area: Brookston Clay, Burford Loam, Caistor Clay, Bottom Land (Ontario GeoHub, MNRF, 2020), with a small section of Perth Clay located in the north-eastern extent of the Study Area. The soils identified along the PR are Caistor Clay, Brookston Clay and Bottom Land. The Soil Survey of Lambton County (1957) describes these soil as follows:

Brookston Clay – Belong to the Dark Grey Gleisolic Great Soil Group. The topography is level to slightly sloping and both the internal and external drainage are slow.



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Caistor Clay - classified as a Grey-Brown Podzolic soil and belongs to the Caistor series. The topography associated with this soil series is slightly undulating. The internal drainage is hindered by a compact subsoil and the external drainage is imperfect because of the numerous saucer-like depressions.

Bottom Land – soils adjacent to stream courses and subject to flooding during part of the year are mapped as Bottom Land. The soil consists of layers of silt, sand and clay intermixed with layers of organic matter.

The soil types found within the Study Area are shown on Figure 7, Appendix C.

Soil capability for agriculture is mapped by Agriculture and Agri-Food Canada (AAFC, 2005). Lands classified as Class 1 are the most agriculturally productive, while those classified as Class 7 have the lowest capability for agriculture. Class 1 to 5 agricultural lands are generally arable, while classes 1 through 3 are defined by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) to be prime agricultural soils for common field crop production. Within the Study Area soils are primarily classified as Class 2,3 and 5 (Appendix C, Figure 8), with a small area of Class 1 soil located in the same area where the Perth Clay is found. The PR crosses soils classified as Class 2,3 and 5. Soils in Class 2 have moderate limitations that restrict the range of crops or require moderate conservation practices, soils in Class 3 have moderately severe limitations that restrict the range of crops or require special conservation practices, and soils in Class 5 have very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible.

4.3.6 Agricultural Tile Drainage

Agricultural tile drains are perforated tubing inserted into the ground below the topsoil with the intentions of improving drainage in the upper root zone. Across the Study Area, agricultural tile drainage is commonly installed below the agricultural fields to improve agricultural productivity. Drains typically discharge into adjacent watercourses or maintained ditches. Of the mapped tile drainage along the PPR, the majority (78%) is mapped as systematic tile drainage while the rest (22%) is mapped as random tile drainage.

Agricultural tile drains are mapped in Figure 9, Appendix C.

4.3.7 Soybean Cyst Nematode (SCN)

Soybean cyst nematode (*Heterodera glycines*) (SCN) is a soil borne parasite that can significantly impact soybean yields. It may be present in some fields in the Study Area. Where equipment is moving from one agricultural field to another there is the potential for the spread of SCN to previously uncontaminated fields. Once a field has been infested there is significant potential for soybean crop loss and there is no effective method of eradication.



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4.3.8 Natural Hazards

Natural hazards are elements of the physical environment that have the potential to affect a project in an adverse manner. Potential natural hazards are limited but may include seismic activity and flooding.

The Study Area lies in the Southern Great Lakes Seismic Zone (Natural Resources Canada, 2019). This zone has a low to moderate level of seismicity when compared to the more active seismic zones to the east, such as the Western Quebec Seismic Zone which captures the area along the Ottawa River and in Quebec. According to data from Natural Resources Canada (2019), over the last 30 years, on average, 2 to 3 magnitude 2.5 or larger earthquakes have been recorded in the Southern Great Lakes region. By comparison, over the same time period, the smaller region of Western Quebec experienced 15 magnitude 2.5 or greater earthquakes per year.

Three moderately sized (magnitude 5) events have occurred in the 250 years of European settlement of this region, all of them in the United States - 1929, Attica, New York, 1986, near Cleveland, Ohio, and 1998, near the Pennsylvania/Ohio border. All three earthquakes were widely felt but caused no damage in Ontario.

A map of the floodplain and regulation limits of SCRCA is provided in Appendix C, Figure 10.

4.4 BIOPHYSICAL FEATURES

4.4.1 Aquatic Features

4.4.1.1 Watercourses

GeoHub/Land Information Ontario (MNR 2020) identifies 19 watercourse crossings along the PR. Watercourse crossings are shown on Appendix C, Figure 11.

All 19 watercourses are located within the Sydenham River watershed and are regulated by the SCRCA.

Three of the watercourses in the Study Area have warm water thermal regimes (Booth Creek-WC-030, Parr McGill Drain-WC-090, and Bear Creek-WC-110) (MNR 2020). All other watercourses in the Study Area have an unknown thermal regime.

Many of the watercourses are designated municipal drains and have an associated DFO drain classification (Kavanagh et al. 2017). Three watercourses are designated Class E drains (permanent flow and sensitive fish species present). Seven watercourses are designated Class F drains (intermittent flow and no sensitive fish species present). Two watercourses are designated Class T drains (tiled). Seven watercourses either do not have a drain designation (no data) or the designation has not been determined (NR – not relevant) because the watercourse is not treated as a drain. Watercourses and associated data are provided below in Table 4.1.



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Table 4.1: Watercourse Crossings on the Preferred Route

| Watercourse Crossing ID | Conservation Authority | Watercourse Name | DFO Drain Classification | Thermal Regime | Watershed |
|-------------------------|------------------------|---------------------------|--------------------------|----------------|-----------|
| WC-010 | SCRCA | 1st Concession Road Drain | E | no data | Sydenham |
| WC-020 | SCRCA | Booth Creek Drain | E | no data | Sydenham |
| WC-030 | SCRCA | Booth Creek | E | warm | Sydenham |
| WC-040 | SCRCA | McCallum Drain | F | no data | Sydenham |
| WC-050 | SCRCA | Black Creek | NR | no data | Sydenham |
| WC-060 | SCRCA | Plum Creek | NR | no data | Sydenham |
| WC-070 | SCRCA | Japp Drain | F | no data | Sydenham |
| WC-080 | SCRCA | Parr South Drain | F | no data | Sydenham |
| WC-090 | SCRCA | Parr McGill Drain | F | warm | Sydenham |
| WC-100 | SCRCA | Fulcher Drain | T | no data | Sydenham |
| WC-110 | SCRCA | Bear Creek | no data | Warm | Sydenham |
| WC-120 | SCRCA | Poland Drain | F | no data | Sydenham |
| WC-130 | SCRCA | Andrews Drain | F | no data | Sydenham |
| WC-140 | SCRCA | Booth Award | no data | no data | Sydenham |
| WC-150 | SCRCA | Blackman Drain | T | no data | Sydenham |
| WC-160 | SCRCA | Gray Drain | NR | no data | Sydenham |
| WC-170 | SCRCA | McDonald Drain | F | no data | Sydenham |
| WC-180 | SCRCA | White Tap Drain | no data | no data | Sydenham |
| WC-190 | SCRCA | Jarvis Drain | NR | no data | Sydenham |

4.4.1.2 Fish and Fish Habitat

Fish community data were available for two watercourses (Booth Creek-WC-030, Bear Creek-WC-110) in the Study Area. These watercourses are both documented to have a diverse warm water fish community (MNRF 2020). DFO aquatic species at risk mapping (DFO 2019) identifies three watercourses in the Study Area that support fish SAR (Booth Creek-WC-030, Black Creek-WC-050 and Plum Creek-WC-060). One watercourse was identified as supporting freshwater mussel SAR (Black Creek-WC-050). Known fish community and aquatic SAR data for watercourses within the Study Area are shown below in Table 4.2.



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Table 4.2: Fish Community and Aquatic SAR Documented in Watercourses from the Study Area

| Species Common Name | Species Scientific Name | ESA Status | SARA Status | WC-030 | WC-110 | WC-050 | WC-060 |
|-----------------------------------|--|------------|-------------|--------|--------|--------|--------|
| Black Bullhead | <i>Ameiurus melas</i> | - | - | | ✓ | | |
| Blackside Darter | <i>Percina maculata</i> | - | - | ✓ | ✓ | | |
| Blackstripe Topminnow | <i>Fundulus notatus</i> | SC | SC | ✓ | ✓ | ✓ | ✓ |
| Bluntnose Minnow | <i>Pimephales notatus</i> | - | - | ✓ | | | |
| Brook Stickleback | <i>Culaea inconstans</i> | - | - | | ✓ | | |
| Brown Bullhead | <i>Ameiurus nebulosus</i> | - | - | ✓ | | | |
| Channel Catfish | <i>Ictalurus punctatus</i> | - | - | | ✓ | | |
| Common Carp | <i>Cyprinus carpio</i> | - | - | ✓ | | | |
| Fathead Minnow | <i>Pimephales promelas</i> | - | - | | ✓ | | |
| Gizzard Shad | <i>Dorosoma cepedianum</i> | - | - | | ✓ | | |
| Green Sunfish | <i>Lepomis cyanellus</i> | - | - | | ✓ | | |
| Johnny Darter x Tesselated Darter | <i>Etheostoma nigrum x Etheostoma olmstedi</i> | - | - | ✓ | ✓ | | |
| Lilliput | <i>Toxolasma parvum</i> | THR | END | | | ✓ | |
| Logperch | <i>Percina caprodes</i> | - | - | | ✓ | | |
| Mapleleaf Mussel | <i>Quadrula quadrula</i> | THR | - | | | ✓ | |
| Northern Pike | <i>Esox lucius</i> | - | - | ✓ | | | |
| Northern Sunfish | <i>Lepomis peltastes</i> | SC | SC | | | ✓ | |
| Redfin Shiner | <i>Lythrurus umbratilis</i> | - | - | ✓ | ✓ | | |
| Spotfin Shiner | <i>Cyprinella spiloptera</i> | - | - | ✓ | | | |
| Spotted Sucker | <i>Minytrema melanops</i> | SC | SC | | | ✓ | |
| Tadpole Madtom | <i>Noturus gyrinus</i> | - | - | ✓ | ✓ | | |
| White Crappie | <i>Pomoxis annularis</i> | - | - | ✓ | ✓ | | |
| White Sucker | <i>Catostomus commersonii</i> | - | - | | ✓ | | |
| Yellow Bullhead | <i>Ameiurus natalis</i> | - | - | ✓ | | | |

ESA: Endangered Species Act, SARA: Species at Risk Act
SC: Special Concern, THR: Threatened, END: Endangered

Under the ESA and SARA, species listed as Threatened (THR) or Endangered (END) are afforded individual and habitat protection. Special Concern (SC) species are not afforded these protections.



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Stantec completed an aquatic habitat assessment at the Black Creek crossing (WC-050) on June 21, 2021. During this assessment a lilliput (*Toxolasma parvum*, a mussel) (END) shell was found on the banks of the watercourse approximately 650 m upstream of the proposed crossing location, indicating the potential presence of this species in the watercourse. The aquatic habitat at the proposed crossing of Black Creek was determined to be suitable for the species.

Fish community sampling and fish/mussel habitat assessment will be completed at the proposed watercourse crossings in the Study Area in 2022.

4.4.2 Designated Natural Areas and Vegetation

The Study Area route falls in the Niagara section of the Deciduous Forest Region (Rowe 1972). This section is heavily settled and has been significantly altered by anthropogenic activities. Extensive forest tracts have been replaced by row crop agriculture and regenerating old fields where agriculture is not feasible. The natural forest of the area has been reduced to farm woodlots, hedgerows and remnant stands. Woodlands, wetlands and other natural areas such as corridors defined as Significant in the Lambton County Official Plan (2020) occur in the Study Area. Mapped designated natural areas are provided in Appendix C, Figure 12.

Woodlands

A woodland is defined as a treed area, woodlot or forested area. LIO identifies woodlands that are traversed by the pipeline route in the Study Area. A desktop review using available aerial imagery was completed to confirm their location and extent across the Study Area. The criteria for designating significant woodlands at a provincial level includes: woodland size; ecological function (shape, proximity to other woodlands or natural features, linkages); species diversity; uncommon characteristics; and, economic and social values (MNRF, 2010). It is the local planning authority's responsibility to designate significant woodlands. Lambton County's Official Plan (OP; Lambton County 2020) identifies significant woodlands as Group "B" Features, described in OP Policy 8.4.2 and shown on Map 2 of the OP Lambton County 2020). Significant woodlands include any forested area that:

- a) is 2 hectares or greater in size b) has woodland interior habitat (100 metres from all edges)
- b) is the largest woodland patch by landform or soil type
- c) is the largest woodland patch occurring on a particular valleyland, or
- d) is 0.5 hectares or greater in size and
 - i. is located within 30 metres of another natural heritage feature specifically identified in the Map 2 feature inventory;
 - ii. provides linkage (a "stepping stone") between (is in a line between and within 120 metres of) two or more significant woodlands that are separated by more than 120 metres of each other;
 - iii. is located on or within 30 metres of a surface water feature;
 - iv. is located above a HVA or significant groundwater recharge area;



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- v. has unique woodland diversity - i.e. contains target communities for Ecodistrict 7E-2 that help to conserve the biodiversity of the Great Lakes region of Ontario as identified by The Great Lakes Conservation Blueprint (Henson et al. 2005);
- vi. has uncommon characteristics such as unique species composition; a rare vegetation community (Natural Heritage Information Centre [NHIC] provincial ranking of S1, S2, or S3); rare, uncommon, or restricted woodland plant species habitat; older woodlands, or larger tree size structure; or;
- vii. has high socio-economic, cultural, historic, or educational value as identified in a local official plan.

The preferred route crosses 10 wooded areas identified by LIO, with approximately 7 of those woodlots anticipated to meet criteria identified in the Lambton County OP (e.g., >2 ha, has interior habitat; <0.5 ha within 30 m of a surface water feature). The preferred route also crosses a “Group B” feature at Bear Creek (see OP Map 2).

Wetlands

The Ontario Wetland Evaluation System is used to identify Provincially Significant Wetlands (PSWs). An evaluated wetland may be one contiguous unit or may be a series of smaller wetlands functioning as a whole. Evaluated wetlands that do not qualify as provincially significant may be designated locally significant and may be protected through local planning and policy measures. There may also be unevaluated wetlands in an area.

A review of the MNR Ontario GeoHub mapping (Ontario GeoHub, MNR, 2021), LIO data (MNR, 2021) and the NHIC database (MNR, 2021) indicates that there are five PSW complexes either completely or partially within the Study Area. The PSW's include Ladysmith Wetland Complex, Bickford Oak Woods Wetland Complex, Clay Creek Woodland, Bear Creek Woodlot #4, and Plum Creek Woods. The PR does not traverse any PSW in the Study Area and comes into proximity to one of the PSW's, the Plum Creek Woods. LIO identifies unevaluated wetlands associated with woodlands in the Study Area, however, the pipeline does not traverse any of these wetland features. The Lambton County OP identifies PSW's as Group “A” Features (Lambton County 2020).

4.4.3 Wildlife Habitat, Wildlife, and Species at Risk

4.4.3.1 Wildlife Habitat, and Wildlife

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). Significant wildlife habitats are grouped into four categories:

1. Seasonal concentration areas
2. Animal movement corridors
3. Rare vegetation communities or specialized habitats



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4. Habitats of species of conservation concern

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. LIO (MNRF 2020) identified one seasonal concentration area in the Study Area, a deer wintering area. This feature borders the Bear Creek corridor and is shown on Appendix C, Figure 12.

Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNRF, 2000). Rivers, creeks and drains may be used as movement corridors. Hedgerows may also serve as small linkages (MNRF, 2000). The pipeline traverses through two “Primary Corridors” which are designated in the Lambton County OP as Group “C” Features (Lambton County 2020). These corridors are associated with Black Creek and Bear Creek. The Lambton County OP indicates that “*Primary Corridors generally represent the stronger existing connections between natural heritage areas, particularly core areas, and follow major watercourses and the lakeshore.*”

Rare Vegetation Communities or Specialized Habitats

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the “state”, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy. Generally, community types with SRANKS of S1 to S3 (i.e., extremely rare to rare – uncommon in Ontario), as defined by the NHIC, could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

An ecological field assessment was completed by Stantec for the five (5) micro-routes in the area of Stanley Line and on June 21, 2021. The assessment identified the presence of a provincially rare plant community along Black Creek, a Fresh-Moist Black Walnut Lowland Deciduous Forest, ELC code FODM7-4. This vegetation community has a Subnational Rank (S-Rank), the conservation status of a species or plant community within a particular province, territory or state, of S2-S3, indicating a range of imperiled to vulnerable in the province. This community is not traversed by the PR.

Specialized habitats are microhabitats that are critical to some wildlife species. The Significant Wildlife Habitat Technical Guide (MNRF, 2000) identifies eight potential specialized habitats associated with the eco-region (7E) of Ontario in which the Project is located:

- Waterfowl nesting area
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat
- Woodland Raptor Nesting Habitat
- Turtle Nesting Areas
- Seeps and Springs



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- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetlands)
- Woodland Area-Sensitive Bird Breeding Habitat

Based on a preliminary review of background information and available aerial imagery, there is potential for all the above listed specialized habitats to be present in the Study Area.

Habitat for Species of Conservation Concern

There are four types of species of conservation concern (SOCC): those which are rare, those with significantly declining populations, those which have been identified as being at risk from certain common activities and those with relatively large populations in Ontario compared to the remainder of the globe.

Rare species are considered at five levels: globally rare, federally rare (with designations by the *SARA*), provincially rare (with designations by Committee on the Status of Species at Risk in Ontario (COSSARO)), regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

The NHIC database (MNRF, 2021) was searched to obtain historic records of SOCC from the vicinity of the Study Area. The following wildlife atlases were also consulted:

- eBird Canada (eBird 2021)
- iNaturalist Canada (iNaturalist 2021)
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature 2020)
- Ontario Butterfly Atlas Online (TEA 2021)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Species at Risk in Ontario List (SARO) (MECP 2021a)

The background review identified 18 SOCC that are known to occur in the vicinity of the Study Area, including two (2) bird species, one (1) insect species, twelve (12) plant species, and three (3) reptile species (Table 4.3).



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Exact locations of species documented from wildlife atlases are not available from these atlases and, instead, are recorded within 1 x 1 km or 10 x 10 km squares. Species documented from iNaturalist do provide exact observed location. The potential for species to be present will be limited by habitat suitability and availability. Therefore, the identified species recorded from these databases may not be present. This list will be further refined upon field investigations and consultation with the MNR and/or SCRC.

Table 4.3: Terrestrial Species of Conservation Concern Potentially Present in the Study Area

| Common Name | Scientific Name | S-RANK | Provincial Status (COSSARO) | National Status (SARA) | Source |
|------------------------|----------------------------------|----------|-----------------------------|------------------------|-------------------|
| Birds | | | | | |
| Eastern Wood-pewee | <i>Contopus virens</i> | S4B | SpC | SpC | SARO |
| Wood Thrush | <i>Hylocichla mustelina</i> | S4B | SpC | THR | NHIC |
| Insects | | | | | |
| Monarch | <i>Danaus plexippus</i> | S2N, S4B | SpC | SpC | TEA |
| Plants | | | | | |
| Compass Plant | <i>Silphium laciniatum</i> | S1 | - | - | iNaturalist |
| Culver's Root | <i>Veronicastrum virginicum</i> | S2 | - | - | iNaturalist |
| Davis' Sedge | <i>Carex davisii</i> | S2 | - | - | NHIC, iNaturalist |
| Georgia Bulrush | <i>Scirpus georgianus</i> | S1? | - | - | iNaturalist |
| Giant Ironweed | <i>Vernonia gigantea</i> | S1? | - | - | iNaturalist |
| Green Dragon | <i>Arisaema dracontium</i> | S3 | SpC | - | NHIC |
| Honey Locust | <i>Gleditsia triacanthos</i> | S2? | - | - | iNaturalist |
| Lance-leaved Fogfruit | <i>Phyla lanceolata</i> | S2? | - | - | NHIC, ORAA |
| Muskingum Sedge | <i>Carex muskingumensis</i> | S3 | - | - | NHIC |
| Ravenfoot Sedge | <i>Carex crus-corvi</i> | S1 | - | - | NHIC |
| Shellbark Hickory | <i>Carya laciniosa</i> | S3 | - | - | iNaturalist |
| Striped Cream Violet | <i>Viola striata</i> | S3 | - | - | NHIC |
| Reptiles | | | | | |
| Eastern Milksnake | <i>Lampropeltis triangulum</i> | S4 | NAR | SpC | ORAA |
| Midland Painted Turtle | <i>Chrysemys picta marginata</i> | S4 | - | SpC | NHIC, ORAA |
| Snapping Turtle | <i>Chelydra serpentina</i> | S4 | SpC | SpC | NHIC |

THR – Threatened - a species that is at risk of becoming endangered



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Table 4.3: Terrestrial Species of Conservation Concern Potentially Present in the Study Area

| Common Name | Scientific Name | S-RANK | Provincial Status (COSSARO) | National Status (SARA) | Source |
|-------------|-----------------|--------|-----------------------------|------------------------|--------|
|-------------|-----------------|--------|-----------------------------|------------------------|--------|

SpC - Special Concern - a species with characteristics that make it sensitive to human activities or natural events

NAR – Not at Risk

S1: Extremely rare in Ontario, 5 or fewer occurrences in the province, vulnerable to extirpation

S2: Very rare in Ontario, 5 and 20 occurrences in the province, susceptible to extirpation

S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure—Uncommon but not rare

S#B- Breeding status rank

S#N- Non-Breeding status rank

NHIC – Natural Heritage Information Centre

ORAA – Ontario Reptile and Amphibian Atlas

SARO – Species at Risk in Ontario List

eBird – eBird Canada

4.4.3.2 Species at Risk

SAR are identified as endangered or threatened under provincial (ESA) legislation. The NHIC database (MNRF 2021) was searched to obtain historic records of species at risk from the vicinity of the Study Area. The following wildlife atlases and information sources were also consulted:

- eBird Canada (ebird 2021)
- iNaturalist Canada (iNaturalist 2021)
- ORRA (Ontario Nature 2020)
- Ontario Butterfly Atlas Online (TEA 2021)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Species at Risk in Ontario List (SARO) (MECP 2021a)

Based on a review of background information, 14 SAR are known to occur in the vicinity of the Study Area, including 5 species of breeding birds, 4 species of mammals, 3 plants species, and 2 reptile species (Table 4.4).

Exact locations of species documented in wildlife atlases are not available from these atlases and, instead, are recorded within 1 x 1 km or 10 x 10 km squares. Species documented from iNaturalist do provide exact observed location. The potential for species to be present will be limited by habitat suitability and availability. Therefore, the identified species recorded from these databases may not be present. This list will be further refined upon field investigations and consultation with the NDMNRF and/or MECP.



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Table 4.4: Terrestrial Species at Risk Potentially Present in the Study Area

| Common Name | Scientific Name | SRANK | Provincial Status (COSSARO) | National Status (SARA) | Source |
|--|-----------------------------------|----------|-----------------------------|------------------------|-------------------|
| Birds | | | | | |
| Bank Swallow | <i>Riparia riparia</i> | S4B | THR | THR | eBird |
| Barn Swallow | <i>Hirundo rustica</i> | S4B | THR | THR | eBird |
| Bobolink | <i>Dolichonyx oryzivorus</i> | S4B | THR | THR | NHIC |
| Eastern Meadowlark | <i>Sturnella magna</i> | S4B, S3N | THR | THR | NHIC |
| Northern Bobwhite | <i>Colinus virginianus</i> | S1?B | END | END | NHIC |
| Mammals | | | | | |
| Eastern Small-footed Myotis | <i>Myotis leibii</i> | S2S3 | END | No Schedule, No Status | Dobbyn, SARO |
| Little Brown Myotis | <i>Myotis lucifugus</i> | S3 | END | END | Dobbyn, SARO |
| Northern Myotis | <i>Myotis septentrionalis</i> | S3 | END | END | Dobbyn, SARO |
| Tricolored Bat | <i>Perimyotis subflavus</i> | S3? | END | END | Dobbyn, SARO |
| Plants | | | | | |
| Butternut | <i>Juglans cinerea</i> | S2? | END | END | SARO |
| Blue Ash | <i>Fraxinus quadrangulata</i> | S2? | THR | SC | NHIC |
| Dense Blazing-star | <i>Liatis spicata</i> | S2 | THR | THR | iNaturalist |
| Reptiles | | | | | |
| Butler's Gartersnake | <i>Thamnophis butleri</i> | S2 | END | END | iNaturalist, ORAA |
| Eastern Foxsnake (Carolinian population) | <i>Pantherophis gloydi pop. 2</i> | S2 | END | END | iNaturalist, ORAA |

THR – Threatened - a species that is at risk of becoming endangered

END – Endangered – a species that is at risk of becoming extirpated or extinct

SpC - Special Concern - a species with characteristics that make it sensitive to human activities or natural events

S1: Extremely rare in Ontario, 5 or fewer occurrences in the province, vulnerable to extirpation

S2: Very rare in Ontario, 5 and 20 occurrences in the province, susceptible to extirpation

S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure—Uncommon but not rare

S#B- Breeding status rank

S#N- Non-Breeding status rank

NHIC – Natural Heritage Information Centre

ORAA – Ontario Reptile and Amphibian Atlas

SARO – Species at Risk in Ontario List

eBird – eBird Canada

Stantec completed a de



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sktop assessment to evaluate the existing conditions of the Study Area and their suitability to support SAR habitat. The habitat in the Study Area may potentially support the following SAR:

1. **Bobolink:** Bobolink lives in tallgrass prairie and other open meadows including hayfields (MECP 2021a). These habitats are relatively common in Southern Ontario and are potentially present in the Study Area.
2. **Eastern Meadowlark:** Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas (MECP 2021a). These habitats are relatively common in Southern Ontario and are potentially present in the Study Area.
3. **Northern Bobwhite:** Northern bobwhites live in savannahs, grasslands, around abandoned farm fields, along brushy fencerows and other similar sites (MECP 2021a). There is potential for these habitats to be present in the Study Area. The range of Northern Bobwhite generally coincides with the Study Area as shown by the species range map (MECP 2021a) but appears to be outside of the area of abundance identified by Environment and Climate Change Canada (ECCC 2018).
4. **Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis:** These *Myotis* SAR species have been documented roosting in buildings, under bridges, in tree cavities, foliage, under tree bark and in rock crevices (Environment Canada 2015). Maternity roosting habitat for these *Myotis* SAR may occur in the mid-aged and mature woodlots, where tree stands have a diameter at breast height of >10 cm. Due to the presence of woodlands in the Study Area, there is a potential for *Myotis* SAR to be encountered.
5. **Tri-colored Bat:** Tri-colored bats will use similar features as the Myotis SAR, however, they have a stronger preference for oak (*Quercus* spp.) and maple (*Acer* spp.) trees with dead or dying leaf clusters in the canopy. Due to the presence of woodlands in the Study Area, there is a potential for Tri-colored bats to be encountered.
6. **Butternut:** Butternut is a medium-sized tree commonly found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar, 1995). Habitat exists for this species in woodland communities, hedgerows, riparian areas, and other naturalized vegetation communities.
7. **Blue Ash:** In Ontario, Blue Ash grows in deciduous floodplain forests, and along sandy beaches and on limestone outcrops associated with Lake Erie (MECP 2021a). The range of Blue Ash generally coincides with the Study Area as shown by the species range map (MECP 2021a).
8. **Dense Blazing Star:** In Ontario, Dense Blazing Star grows in moist prairies, grassland savannahs, wet areas between sand dunes, and abandoned fields (MECP 2021a). Dense Blazing Star is documented within the Study Area on iNaturalist (2021).
9. **Butler's Gartersnake:** The Butler's Gartersnake prefers open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms (MECP 2021a). Butler's Gartersnake is documented within the Study Area on iNaturalist (2021).
10. **Eastern Foxsnake:** Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals and shorelines (MECP 2021a). Eastern Foxsnake is documented within the Study Area on iNaturalist (2021).



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Consultation with the MECP took place on September 1, 2021, via a teleconference with staff from Enbridge Gas, Stantec and MECP in attendance. In a post-meeting summary email from the MECP the following additional records were provided of SAR occurrences directly within the proposed route and in the general area (A. Zarkovich, personal communication, September 1, 2021):

Table 4.5: Additional Species at Risk Identified by MECP During Consultation

| Common Name | Scientific Name | Provincial Status (COSSARO) | National Status (SARA) |
|--------------------------------|-------------------------------|-----------------------------|------------------------|
| Birds | | | |
| Yellow-breasted Chat | <i>Icteria virens</i> | END | END |
| Plants | | | |
| Eastern Flowering Dogwood | <i>Cornus florida</i> | END | END |
| Kentucky Coffee-tree | <i>Gymnocladus dioicus</i> | THR | THR |
| Eastern Prairie Fringed-Orchid | <i>Platanthera leucophaea</i> | END | END |
| Colicroot | <i>Aletris farinosa</i> | END | END |
| Reptiles | | | |
| Blanding's Turtle | <i>Emydoidea blandingii</i> | THR | END |
| Aquatic | | | |
| Pugnose Shiner | <i>Notropis anogenus</i> | THR | THR |
| Pugnose Minnow | <i>Opsopoeodus emiliae</i> | THR | THR |
| Fawnsfoot | <i>Truncilla donaciformis</i> | END | END |

THR – Threatened - a species that is at risk of becoming endangered

END – Endangered – a species that is at risk of becoming extirpated or extinct

Consultation with the MECP is recommended to continue as the Project proceeds.



4.5 SOCIO-ECONOMIC ENVIRONMENT

4.5.1 Demographics

The population and gender breakdown of the Project area in 2016 is presented in Table 4.6 below.

Table 4.6: Population and Gender, 2016

| Location | Total Population | Land Area (km ²) | Population Density per km ² | Percent Change from 2011 |
|--------------------------|------------------|------------------------------|--|--------------------------|
| Ontario | 13,448,494 | 908,699 | 14.8 | 4.6 |
| Lambton (County) | 126,638 | 3,002 | 42.2 | 0.3 |
| Dawn-Euphemia (Township) | 1,967 | 445 | 4.4 | -4.0 |
| St. Clair (Township) | 14,086 | 6,196 | 22.8 | -3.0 |

Source: Statistics Canada 2017a, 2017b, 2017c

Lambton County has a small population relative to the province of Ontario. The populations of the Townships of Dawn-Euphemia and St. Clair account for 1.6% and 11.1% of the population of Lambton County. Over half (56.5%) the population of Lambton County resides in the City of Sarnia, which was 71,594 people in 2016 (Statistics Canada 2017d). The Project area is not densely populated and reflects a rural environment.

There was a decrease in population in both Dawn-Euphemia and St. Clair between 2011 and 2016, in contrast to a slight increase in Lambton overall. The population change in Dawn-Euphemia, St. Clair and Lambton overall was all less than the wider province of Ontario.

Information regarding the demographics of the population is presented in Table 4.7.

Table 4.7: Density, Age and Indigenous Peoples, 2016

| Location | Male ¹ | Female ¹ | Median Age | Population Identifying as Aboriginal ^{2,3} |
|--------------------------|-------------------|---------------------|------------|---|
| Ontario | 6,559,390 | 6,889,105 | 41.3 | 374,395 |
| Lambton (County) | 62,000 | 64,640 | 46.1 | 6,890 |
| Dawn-Euphemia (Township) | 1,065 | 910 | 43.4 | 15 |
| St. Clair (Township) | 7,030 | 7,055 | 45.4 | 465 |

Notes:

¹Numbers are rounded by Statistics Canada and are reported herein exactly as they are reported by Statistics Canada. Totals may not necessarily add up as a result of rounding.

² Estimates associated with this variable are more affected than most by the incomplete enumeration of certain Indian reserves and Indian settlements in the 2016 Census of Population.

³Aboriginal identity' includes persons who are First Nations (North American Indian), Métis or Inuk (Inuit) and/or those who are Registered or Treaty Indians (that is, registered under the Indian Act of Canada) and/or those who have membership in a First Nation or Indian band. Aboriginal peoples of Canada are defined in the Constitution Act, 1982, section 35 (2) as including the Indian, Inuit and Métis peoples of Canada.

Source: Statistics Canada 2017a, 2017b, 2017c



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There were more individuals identifying as female than male in St. Clair and Lambton overall, which is consistent with the province of Ontario. In Dawn-Euphemia, there were fewer individuals identifying as female than male. The median age is lower in Dawn-Euphemia than St. Clair township and the median age in both townships is lower than Lambton overall. The median age in the area is higher than the wider province of Ontario.

There were very few individuals identifying as Indigenous in Dawn-Euphemia, approximately 0.2% of the county. The number of Indigenous people is larger in St. Clair (approximately 6.7% of the county). The number of Indigenous people in Lambton County comprise 1.8% of the Indigenous people in Ontario.

4.5.2 Employment and Business

The most recent economy and employment statistics are provided in the 2016 Census of Population (Statistics Canada 2017). Table 4.8 summarizes the unemployment and employment rate, participation rate, and the median income of persons over the age of 15 captured at the time of census in Ontario, County of Lambton (subsequently referred to as Lambton), and the Townships of Dawn-Euphemia and St. Clair (Statistics Canada, 2017).

Table 4.8: Labour Characteristics for Persons > 15 years, 2016

| Location | Total Population 15 years and Over | Labour Force | Employed | Participation Rate (%) | Employment Rate (%) | Unemployment Rate (%) |
|--------------------------|------------------------------------|--------------|-----------|------------------------|---------------------|-----------------------|
| Ontario | 11,038,440 | 7,141,675 | 6,612,150 | 64.7 | 59.9 | 7.4 |
| Lambton (County) | 105,015 | 61,465 | 56,485 | 58.5 | 53.8 | 8.1 |
| Dawn-Euphemia (Township) | 1,545 | 1,010 | 950 | 65.4 | 61.5 | 5.9 |
| St. Clair (Township) | 11,715 | 7,175 | 6,530 | 61.2 | 55.7 | 9.0 |

Source: Statistics Canada (2017).

As shown in Table 4.8, in 2016, St. Clair and Lambton overall had lower participation and employment rates, and higher unemployment rates when compared to the rates for the wider province of Ontario. Dawn-Euphemia had higher participation and employment rates, and lower unemployment rates when compared to the province and neighboring St. Clair.

Median income for households and individuals is presented in Table 4.9.



Table 4.9: Median Income, 2015

| Location | Median Total Income of Households (\$) | Median Total Income of Individuals (\$) |
|--------------------------|--|---|
| Ontario | \$74,287 | \$33,539 |
| Lambton (County) | \$70,022 | \$34,668 |
| Dawn-Euphemia (Township) | \$70,571 | \$30,784 |
| St. Clair (Township) | \$86,112 | \$40,731 |

Source: Statistics Canada (2017).

Median income of households in Lambton overall was less than the provincial median by \$4,265. Median income of individuals in Lambton was more than the provincial median by \$1,129. Within Lambton County, both median income of households and median income of individuals were higher in St. Clair than in Dawn-Euphemia. Median income of individuals in Dawn-Euphemia was approximately 75% of the median income of individuals in St. Clair.

The top three occupation classifications in Lambton included sales and service occupations (23.9%), trades, transport and equipment operators and related occupations included (18.3%) and business, finance and administration occupations (11.9%). These are the same top three occupation classifications in Ontario overall (Statistics Canada 2017).

The top three occupation classifications in Dawn-Euphemia included trades, transport and equipment operators and related occupations included (22.4%), management occupations (18.4%) and sales and service occupations (11.9%). The top three occupation classifications in St. Clair included trades, transport and equipment operators and related occupations included (21.0%), sales and service occupations (16.9%) and business, finance and administration occupations (15.0%).

A community profile report prepared by the Sarnia Lambton Workforce Development Board (2015) indicated that between 2006 and 2011, several major manufacturing companies (including Dow Chemical, Woodbridge Foam, UBE and others) shut down. This, along with slow recovery from the 2008 recession and associated impacts to the oil and gas sector, may have contributed to the higher rates of unemployment in St. Clair, and Lambton County overall, relative to the province, particularly when considering the percentage of workers in Lambton employed in manufacturing and trades occupations.

4.5.3 Community Services & Infrastructure

Permanent and Temporary Accommodations

In 2016, there were 765 occupied private dwellings in the Township of Dawn-Euphemia. The majority of homes were single-detached houses (750) and the average household size was 2.6 persons. The majority of occupants were owners and not renters (83.6%) (Statistics Canada 2017b).

In the Township of St. Clair there were 5,785 occupied private dwellings, the majority of which were also single-detached houses (5,205), and the average household size was 2.4 persons. The majority of occupants were owners and not renters (83.8%) (Statistics Canada 2017c).



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In Lambton County overall, there were 54,480 occupied private dwellings, the majority of which were single-detached houses (41,285) and the average household size was 2.3 persons. The majority of occupants were owners and not renters (74.5%) (Statistics Canada 2017a).

The Townships of Dawn-Euphemia and St. Clair are in Provincial Tourism Region 1 (Southwest Ontario) (MHSTCI 2017). In 2019, the hotel occupancy rate (temporary accommodations) in the Region 1 was 62.0%, an increase from 50.6% in 2008 (MHSTCI 2020). In 2019 there was a total of 395 temporary accommodations establishments within the Provincial Tourism Region 1. The majority of the establishments were hotels (including motor hotels and motels) which numbered 192 (49%). There were also 84 RV parks (21%), 54 camps (including hunting and fishing and recreational vacation camps) (14%) and 29 bed and breakfasts (7%). The remaining accommodation types included housekeeping cottages/cabins, resorts, and all other types of traveller accommodates (MHSTCI 2020).

Temporary accommodations within and adjacent to the Study Area are limited to small bed-and-breakfasts. There are campgrounds to the west, along the St. Clair River, and hotels in Sarnia, approximately 10km north of Corunna Station.

The COVID-19 pandemic has had an impact on travel and tourism in Ontario (MHSTCI 2021), and the number of operating establishments offering temporary accommodations has likely changed since 2019, when these data were collected.

Municipal Services and Infrastructure

The Lambton Area Water Supply System (LAWSS) supplies water to over 100,000 customers located across the County of Lambton, including St. Clair Township but excluding Dawn-Euphemia (AECOM 2021). The LAWSS includes a direct filtration water treatment plant and 250km of water main. The system is operated by the Ontario Clean Water Agency (LAWSS n.d.).

The Township of Dawn-Euphemia is supplied water services through the Township of Enniskillen who in turn receives water from the Town of Petrolia's water treatment plant located in Brights Grove on Lake Huron. The Township of Dawn-Euphemia's Public Works Department is responsible for the operation, repair and maintenance of the distribution system, the repairs and replacement of water meters the flushing of water mains and reading the water meters (Township of Dawn-Euphemia, n.d.).

Health and Education Services and Infrastructure

All of Lambton County is served by the Lambton Public Health. Bluewater Health operations two hospitals in Lambton County; Charlotte Englehart Hospital in Petrolia, Ontario and Bluewater Health in Sarnia, Ontario (County of Lambton 2019a).



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There is one elementary public school and no public high schools in the Study Area; Brigden Public School, which is part of the Lambton Kent District School Board (Lambton Kent District School Board 2017). The Conseil scolaire Viamonde, the Conseil scolaire catholique Providence and the St. Clair Catholic District School Board also operate schools in Lambton County, but there are no schools in the Study Area (Conseil scolaire Viamonde 2021; Conseil scolaire catholique Providence n.d.; St. Clair Catholic District School Board n.d.).

Roads, Highways and Culverts

The Public Works department of the County of Lambton is responsible for managing the County of Lambton Road system, which includes almost 650 km of roadway and over 190 bridges and major culverts in both St. Clair Township and Dawn-Euphemia Township (County of Lambton 2019a). There are four arterial county roads in the Study Area, including County Road 2 and County Road 80, which travel east-west, and County Road 26 and County Road 31, which travel north-south. There are many additional local roads and there are no Ministry of Transportation (MTO) network roads (County of Lambton, n.d.).

Policing, Fire and Emergency Response Services

The Township of Dawn-Euphemia and the Township of St. Clair have contracted their Police Services with the Ontario Provincial Police. There are no detachments in the Study Area; the nearest detachments are located in Petrolia, Ontario and Corunna, Ontario (OPP 2019).

In St. Clair Township there is one full-time fire chief and two full-time deputy chiefs, six fire stations, and 170 volunteer fire-fighters. There are two fire stations in the Study Area located in Bridgen and Wilkesport, Ontario. The Township of Dawn-Euphemia operates four fire stations, located in Dawn-Euphemia (servicing the former Dawn portion of the Township), Bothwell (servicing the southern part of the former Township of Euphemia), Inwood (servicing the westerly portion of the former Township of Euphemia) and Alvinston (servicing the eastern portion of the former Township of Euphemia).

Land ambulance services are provided by Lambton County's Emergency Medical Services (Lambton EMS) Department to all the residents of Lambton County.

4.5.4 Culture, Tourism and Recreational Facilities

The Study Area contains parks and trails, community centres and agricultural activities, including farmer's markets and stands, agricultural societies (Tourism Sarnia-Lambton 2021). The Brigden fairgrounds are located in the Study Area, where the Moore Agricultural Society runs the annual Bridgen Fair on Thanksgiving weekend, along with regular events through the year, including brunches, drive-in movie screenings and jamborees (Moore Agricultural Society 2020). The Study Area contains several conservation areas and green spaces including Moore Conservation Area, McKellar Tract, Nicholl's Memorial Forest, and the Bickford Oak Woods, which offer opportunities for fishing and hiking (St. Clair Region Conservation Authority 2021). In the fall there is recreational hunting, and in the winter, there are opportunities for snowshoeing and cross-country skiing.



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4.5.5 Air Quality and Noise

The landscape within the Study Area comprises agricultural land, open space or natural heritage features. Agricultural operations have the potential to expel air emissions. Although the Study Area does not have a high population density, air emissions will be released through vehicle use.

According to the Environmental Noise Guideline (MOECC 2013), the landscape within the Study Area would most likely be categorized as a Class 3 area. This means “a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as a small community; agricultural area; a rural recreational area such as a cottage or a resort area; or a wilderness area.” Portions of the landscape within the Study Area in proximity to town centers and sub-urban areas would be categorized as a Class 2 area. This means “an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas” with an acoustical environment dominated by the activities of people, usually road traffic during the day, and evening and night background sound defined by natural environment and infrequent human activity.

The area is expected to experience a low traffic volume that represents a minimal source of noise for the majority of the existing route. Other minor noise sources within the Study Area include occasional sounds due to anthropogenic agricultural activities and occasional sounds due to anthropogenic domestic activities such as property maintenance and recreation.

4.5.6 Land Use

The Study Area is in the Township of Dawn-Euphemia, and the Township of St. Clair, which are both in the County of Lambton. The preferred pipeline route is proposed to be constructed within existing RoWs where possible, while some sections will cross public and private lands with various land use designations.

According to the Official Plan for the County of Lambton (County of Lambton 2020), the Study Area is almost exclusively designated as Agricultural Area, with the Town of Brigden designated as Urban Settlement and the Town of Wilkesport designed as Secondary Settlement. The Dawn and Corunna compressor stations are designated as Gas Compressor Station (County of Lambton 2020). There were no natural hazard features and no mineral aggregate resources noted in the Study Area, however there were five Designated Hydrocarbon Storage Areas (natural gas storage pools) in the Study Area, as well as two oil pools; active hydrocarbon wells are present, associated with those areas (County of Lambton 2020).

There were several natural heritage system features identified on Map 2 of the County of Lambton Official Plan, including one Core Area (Bear Creek – Black Creek Core Area). Other identified natural heritage features in the Study Area include Brigden Wetland Complex, Vulture Woods, Plum Creek, Bear Creek Woodlots and Floodplain and the McKeough Upstream Lands (County of Lambton 2020).



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4.5.7 Landfills and Contaminated Sites

Landfills

The County of Lambton currently operates a single landfill within its County boundaries: the Dawn Landfill Site, located approximately 2.5 km west of Oil Heritage Road at 4084 Langbank Line in the Township of Dawn-Euphemia.

In accordance with the MECP's Guideline D-4 Land Use on or Near Landfills and Dumps (1994), active and closed landfills within 500 m of the Study Area were reviewed. The potential location of these sites in the Study Area was determined by cross-referencing Official Plan mapping for the Township of St. Clair maps (2005) and the County of Lambton Official Plan mapping (2020) and the MECP's Small and Large Landfill Sites listed on the MECP website (2021; 2020).

Five privately owned and operated small landfill sites are currently operational in the County of Lambton: the NOVA Chemicals Nova Corunna Landfarm Site located at 785 Petrolia Lane, a Clean Harbors Canada landfill located at 4090 Telfer Road, two landfills owned by Ontario Power Generation and the Shell Canada Sarnia Manufacturing Centre located at 150 St. Clair Parkway in the Township of St. Clair (MECP, 2021b). The County of Lambton is responsible for providing waste disposal facilities to receive and dispose of municipal solid waste generated by local municipalities. The County-owned Dawn Landfill, a 36-acre site with a landfill area of 14 acres, is located at 4084 Langbank Line in the Township of Dawn-Euphemia (Lambton County, 2019). One privately owned and operated large landfill site is currently operational in the County of Lambton: Waste Management of Canada Corporation's Twin Creeks Landfill, located at 5768 Nauvoo Road in Watford, Ontario (Waste Management, 2021).

Contaminated Sites

Contaminated sites in and near the Study Area were determined by reviewing Official Plans, the MOECC Brownfield's Environmental Site Registry (MOECC, 2011) and the Federal Contaminated Sites Inventory accessed through the Treasury Board of Canada Secretariat's website (Treasury Board, 2011).

These sources did not identify any potential contaminated, brownfield sites, or formal industrial sites within 500 m of the PPR. There are two (2) contaminated sites within the Study Area according to the Federal Contaminated Sites Inventory; one active and the second closed. The active contaminated site [#00027921] is located in the Town of Brigden, approximately 2 km northeast of Alternative Route 1 and 2. The closed contaminated site [#00015114] is approximately 3.5 km southwest of the Dawn Compressor Station (Treasury Board, 2011).

4.5.8 Archaeological Resources

Existing Conditions

A Stage 1 AA (Appendix D) has been conducted for the Study Area. A copy of the completed Stage 1 AA report will be circulated to interested Indigenous communities and submitted to the MHSTCI for review and inclusion into the *Public Register of Archaeological Reports*.



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Initial background research compiled information concerning potential archaeological resources and features of archaeological potential within the study area. Archaeological potential is established by determining the likelihood that archaeological resources may be present within a study area. Stantec applied archaeological potential criteria commonly used by the MHSTCI (Government of Ontario 2011) to determine areas of archaeological potential within the study area. These variables include proximity to previously identified archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography, and the general topographic variability of the area. However, it is worth noting that extensive land disturbance can eradicate archaeological potential (Government of Ontario 2011).

Primary water sources are identified within the Stage 1 study area, including the Sydenham River, Black Creek, Indian Creek, Plum Creek, Crooked Creek, Nichol Creek, Jarvis Creek, Clay Creek, and Booth Creek. Additional ancient and/or relic tributaries of water sources may have existed but are not identifiable today and are not indicated on historic or modern mapping. The soil composition of the study area generally comprises clay to silt textured till, derived from glaciolacustrine deposits or shale, and modern alluvial deposits, composed of clay, silt, sand, gravel, and organic remains (Ontario Geological Survey 2010). Such conditions are suitable for Indigenous and Euro-Canadian agriculture, especially following the implementation of municipal drainage systems and agricultural field tiling in the 19th and 20th centuries. An examination of the *Ontario Archaeological Sites Database* has shown that there are 32 archaeological sites registered within the study area or within one kilometre of the study area (Government of Ontario 2021).

Archaeological potential can be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements; early transportation routes; and properties listed on the municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 1990a) or property that local histories or informants have identified with possible historical events, activities, or occupations. Historical mapping demonstrates that the study area includes early concession roads with structures illustrated as fronting these roads; particularly along major arterial roads. Much of the established road and rail networks and agricultural settlement from the 19th century are still visible today.

Overall, the Stage 1 AA determined that the majority of the study area retains potential for the identification of Indigenous and Euro-Canadian archaeological resources.

4.5.9 Cultural Heritage Resources

The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (the Checklist) was completed for the Study Area. The checklist is used to identify protected and potential cultural heritage resources within the study area and make recommendations for future work, as appropriate.

In order to identify cultural heritage resources, the MHSTCI, Ontario Heritage Trust (OHT), Township of St. Clair, Township of Dawn-Euphemia, and the Township of Enniskillen were consulted. As a result of consultation, no protected properties or heritage interests were identified. At the provincial level, Karla Barboza, Team Lead, Heritage, with MHSTCI confirmed there are no provincial heritage properties or



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properties designated by the Minister within or adjacent to the Study Area. Kevin DeMille, Heritage Planner, with OHT, reported that there are no OHT conservation easements or Trust owned properties within or adjacent to the Study Area.

At the municipal level, on May 7, 2021, Donna Clermont, Administrator-Clerk, and Ezio Nadalin, Planner, for the Township of Dawn-Euphemia confirmed that there are no municipally protected heritage interests within or adjacent to the Study Area. On May 10, 2021, Duncan McTavish, Administrator-Clerk, confirmed the same for the Township of Enniskillen. At the time of this memo, a response had not been received from St. Clair Township.

The Checklist was completed for the Study Area based on background research, agency consultation, and review of historic mapping. Overall, five indicators of cultural heritage value or interest (CHVI) were identified in the Study Area. Results of the checklist are included in Table 8 and the completed Checklist is included in Appendix E.

Table 4.10: Screening for Known (or recognized) Cultural Heritage Value According to MHSTCI Checklist

| Indicators of Cultural Heritage Value or Interest | Identified within the Study Area |
|--|----------------------------------|
| Property identified, designated or otherwise protected under the OHA as being of cultural heritage value | Not Identified |
| A National Historic Site (or part of) | Not Identified |
| Designated under the <i>Heritage Railway Stations Protection Act</i> | Not Identified |
| Designated under the <i>Heritage Lighthouse Protection Act</i> | Not Identified |
| Identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office | Not Identified |
| Located within a United Nations Educational, Scientific and Cultural Organization World Heritage Site | Not Identified |
| Is subject of a municipal, provincial or federal commemorative or interpretative plaque | Identified |
| Has or is adjacent to a known burial site and/or cemetery | Identified |
| Is in a Canadian Heritage River watershed | Not Identified |
| Contains buildings or structures that are 40 or more years old | Identified |
| Is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area | Identified |
| Has a special association with a community, person or historical event | Identified |
| Contains or is part of a cultural heritage landscape | Not Identified |



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4.5.10 Indigenous Interests

There are no Indigenous communities located within the study area. Ontario, as the Crown, has a legal duty to consult with Indigenous peoples regarding projects or decisions that may adversely impact constitutionally protected Indigenous or treaty rights. Indigenous communities were identified through provision of a Project Summary to the MENDM in February 2021 (see Appendix B1) are as follows:

- Aamjiwnaang First Nation;
- Chippewas of the Thames First Nation;
- Oneida Nation of the Thames;
- Chippewas of Kettle and Stony Point First Nation; and
- Bkejwanong (Walpole Island) First Nation.

The closest Indigenous community to the Project study area is the Aamjiwnaang First Nation, located within St. Clair Township, approximately 7 km from the northwestern corner of the Study Area.



5.0 POTENTIAL IMPACTS, MITIGATION AND PROTECTIVE MEASURES AND NET IMPACTS

5.1 METHODOLOGY

The potential effects and impacts of the project on physical, biophysical, and socio-economic features have been assessed in the Study Area upon review of the existing conditions outlined in Sections 4.3-4.5. With an understanding of pipeline construction and operation activities (see Sections 5.1.1 and 5.1.2, respectively) the assessment:

- Describes the environmental and socio-economic setting
- Predicts the effects and associated impacts of construction and operation activities
- Recommends supplemental studies, mitigation and protective measures (including construction methods and timing, site-specific mitigation, environmental protection measures, and compensation measures)
- Outlines the net impacts that are likely to remain

The determination of effects, impacts, and mitigation and protective measures considered:

- Comments expressed during the consultation program
- Information available from published and unpublished literature
- Maps and digital data
- Mitigation guidance documents
- The pipeline development experience of Enbridge Gas and Stantec

By necessity, the analysis, integration, and synthesis of the data is an iterative process since information becomes available at various stages of the study and at different mapping scales. The level of detail of data and mapping increases as the study moves from analysis of the study area to a site-specific survey of features in the Project footprint. The data available at the current stage of the environmental study is appropriate for predicting effects and potential impacts and recommending mitigation and protective measures.

Specific information requests were made to several agencies throughout the project. The information collected assisted in identifying environmental features and constraints located on and adjacent to the proposed pipeline route, the potential presence of SAR and their habitat, predicting effects and potential impacts, and developing mitigation and protective measures. Where agencies requested that information be kept confidential, such as the precise location of rare, threatened, vulnerable or endangered species and archaeological sites, such information has been withheld from the report or mapped in such a way that specific site locations cannot be determined.

Site-specific field surveys will be completed prior to construction.



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The existing conditions maps (Appendix C) have been generated from data obtained from LIO. Conservation Authority (CA) regulated area data was obtained from SCRCa. Scales have been adjusted from the original source to better represent the features mapped. Stantec has digitally reproduced features added to the base maps. Additional mapping sources are identified on the respective map, and in the references.

There are instances where field investigations are recommended before construction. Given the location of the Project components and experience of Stantec in providing environmental services for natural gas pipelines, these supplemental studies are not expected to change the conclusions regarding potential adverse residual impacts. The environmental and socio-economic information presented in the ER is based on sources cited throughout.

Table 5.1 below notes the potential impacts, mitigation and protective measures, including recommended supplemental studies, and net impacts for the existing conditions as described in Sections 4.3 - 4.5.

5.1.1 Construction

The pipeline construction process includes various activities as described below:

1. **Site Preparation and Clearing:** The first activity is typically the survey and staking, which delineate the boundaries of the RoW and temporary work areas. Next, the RoW and temporary work areas are cleared of brush and trees (typically during winter, under frozen ground conditions). In the spring the fences that break up the linear RoW are braced and cut to permit an uninterrupted work area. Safety fence is installed at the edge of the construction RoW where public safety considerations are required, and aspects of the traffic management plan are implemented (i.e., signs, vehicle access). Silt fence is installed at required locations. Pre-tiling work is completed to accommodate agricultural drainage.
2. **Grading and Stripping:** The RoW is graded to allow for access by construction equipment. At this stage, the topsoil (on agricultural lands) or the duff layer (on natural lands) is stripped by bulldozers and graders then segregated so it will not be mixed with the subsoil later removed from the trench. Existing landscaping is also removed, and dewatering undertaken, where necessary.
3. **Stringing:** Stringing is the process where pipe sections are delivered to the full length of the RoW, placed on wooded skids and generally parallel to where the trench will be excavated.
4. **Pipe Fabrication:** The pipe is bent as required and the welding crew welds the pipe into continuous lengths. The pipe welds are non-destructively tested (e.g. x-ray) and coated.
5. **Trenching and Lowering:** After the pipe is fabricated, a trenching machine or hydraulic hoe can begin excavating a new trench. In areas of shallow bedrock, hoe-ramming and/or blasting may be required. In agricultural areas, tiles that are cut during the trench excavation are flagged and repaired as quickly as practical. In some areas the pipeline cannot be installed by trenching due to obstacles such as roads or watercourses. In these locations the pipeline is installed using a trenchless approach through a variety of different means. Laneways and driveways are left over the trench as long as feasible where requested by the landowner.
6. **Backfilling:** During backfilling the originally excavated subsoil is placed over the pipe in the trench. In stony areas, the pipe may be sand-padded to protect the coating. In shallow water table areas, the pipeline may be weighted to provide negative buoyancy. In agricultural areas, after the trench is



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backfilled, tiling is repaired that was disturbed or broken by construction. Landowners with tile drainage are given the opportunity to inspect tile repairs. Typically, a tile consultant is retained to oversee tile repairs and the design of a header tile system if required.

7. Hydrostatic Testing: The pipeline is pressure tested by filling the pipe with water and holding it at a high pressure for a set period of time, **per the requirements of CSA Z662-19 Clause 8 and applicable Enbridge Gas specifications for pressure testing**. Water is typically drawn by permit from nearby water sources such as watercourses or lakes, if available. Municipal water may also be used for hydrostatic testing. Upon completion of the hydrostatic testing, the pipeline is drained and dried then put into service with natural gas.
8. Clean-Up and Restoration: Clean-up is the restoration of the RoW and other work areas. On agricultural land, this may require decompaction of the subsoil and stone picking to maintain productivity. In natural areas, clean-up restores the environment including re-seeding of the RoW, returning the topography after grading, restoring ditch banks and watercourse crossings. Any erosion and sediment controls (ESC) installed during construction are also removed. Clean-up will also restore landscaping, laneways and driveways.

5.1.2 Operation and Maintenance

Pipeline operation consists of pressurized natural gas flowing through the pipeline. Mainline valves located at the valve sites will serve to shut off and isolate the pipeline for maintenance and security purposes. Additional above-ground facilities along the pipeline include post-mounted signs identifying the pipeline, aerial patrol signs for aircraft patrols, fence stiles, foot bridges for ditch crossings (if applicable), and "test boxes" located along fence lines at roads that are used to assess the adequacy of the corrosion protection system.

Once the pipeline is operational, the following activities are undertaken to patrol and maintain the pipeline:

- Completing a 'line walk' of the entire pipeline by Enbridge Gas personnel once a year to check for exposed pipelines, evidence of damage to aboveground equipment and piping, evidence of damage to underground piping and gas leaks, and identify any unassociated construction activity near the pipeline RoW
- Conducting aircraft patrols weekly from April 1 to December 31 and monthly from January 1 to March 31 to detect the presence of soil erosion and third-party structures or activities that could damage the pipeline
- Checking cathodic corrosion protection – a low voltage electric circuit that runs along the length of the pipeline to prevent the development of external corrosion
- Completing regular checks and maintenance at pipeline facilities such as valve sites
- Completing depth of cover surveys, so that the amount of soil cover over the pipeline is maintained
- Performing periodic inspection by running electronic tools through the interior of the pipeline to assess for the presence of corrosion or dents and the need for repairs
- Completing class location surveys.



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5.2 SUMMARY TABLE

Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|---|---|---|--|
| PHYSICAL FEATURES | | | |
| Bedrock Geology and Drift Thickness <i>Section 4.3.1</i> | The planned excavation depth for the project is approximately 2 m below grade with the potential to exceed this depth for watercourse, road crossings and other sensitive features. Based on the depth of the excavations and the significant depth to bedrock shown in the published information, bedrock is not likely to be encountered. | As no potential impacts are anticipated, no mitigation or protective measures are required. | No significant adverse residual impacts to bedrock geology and/or drift thickness are anticipated. |
| Physiography and Surficial Geology <i>Section 4.3.2</i> | Disturbance to the overburden within the Study Area may cause surface soil erosion and trench slumping during construction or post-construction at areas that may require further rehabilitation. | <ul style="list-style-type: none"> • Surface soil erosion can occur in the absence of vegetative cover. Where there is potential for soil erosion, the need for and location of ESC measures should be determined by an inspector with appropriate qualifications and installed prior to the commencement of work in the area. • When land is exposed, the exposure should be kept to the shortest practical period. Natural features should be preserved to the extent practical. Temporary vegetation and mulching should be used to protect areas as appropriate. Where required, natural vegetation should be re-established as soon as practical. • The contractor must obtain adequate quantities of materials to control erosion. Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. • Even with ESC measures, extreme precipitation events could result in collapse of silt fencing, | With the implementation of the mitigation and protective measures, no significant adverse residual impacts to or from the overburden material are anticipated. |



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| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|---|---|---|---|
| | | <p>overflow or bypass of barriers, and other situations which could lead to erosion. When site conditions permit, permanent protection measures should be installed on erosion susceptible surfaces. If the erosion is resulting from a construction-related activity, the activity should be halted immediately until the situation is rectified.</p> <ul style="list-style-type: none"> • To avoid the trench from slumping, trench walls should be sloped and should be monitored during wet conditions for the potential to slump. • Slope stability should be reviewed at watercourse crossing locations. Watercourse banks should be seeded and stabilized immediately following crossing. ESC and stabilization measures should be maintained during construction, restoration, and rehabilitation until vegetative cover is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. Permits obtained under O. Reg. 171/06 from SCRCA may contain conditions pertaining to ESC. | |
| <p>Groundwater <i>Section 4.3.3</i></p> | <p><u>Hydrostatic Testing and Dewatering</u></p> <p>The pipeline will be hydrostatically tested before commissioning. Select sections of pipe may also be pre-tested, such as at road crossings. Water required for the testing may be obtained from a municipal or natural source. Before the withdrawal of water from a municipal source, the municipality will be contacted to confirm the maximum rate of withdrawal.</p> <p>Where trenches encounter shallow groundwater conditions or following a large precipitation event, removing</p> | <p><u>Hydrostatic Testing and Dewatering</u></p> <ul style="list-style-type: none"> • For groundwater dewatering, the MECP allows registration under the EASR for construction dewatering projects where groundwater takings will be greater than 50,000 L/day and less than 400,000 L/day; however, should groundwater takings exceed 400,000 L/day, a PTTW may be required from the MECP. • If surface water is used as the source water for the hydrostatic test, a PTTW application would be required and would include an assessment of the capacity of the source to provide the required water without impacting the ecosystem, and recommendations for mitigation measures such as | <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts on groundwater are anticipated.</p> |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--------------------------|---|---|-------------|
| | <p>water from the trench (known as dewatering) may be necessary. During trench dewatering, discharge water will be released to the environment. An uncontrolled discharge of water could cause downstream flooding, erosion, sedimentation, or contamination. Other potential effects of uncontrolled discharge may include introduction of foreign aquatic organism to a drainage basin and introduction of hazardous materials or pollutants to soils or bodies of water.</p> <p><u>Private Water Wells</u></p> <p>There are approximately 668 private water wells within the Study Area. Depending on the proximity to wells, the depth of the well installation and the groundwater levels encountered during excavation, trench dewatering may impact water well quality or quantity at some of the overburden supply wells.</p> <p><u>Municipal Water Supply</u></p> <p>Mapping by the MECP (MECP, 2020b) indicates there are no IPZs or Wellhead Protection Areas (WPHA's) identified in the Study Area. Within St. Clair Region, all municipal drinking water intakes use surface water from Lake Huron or in Wallaceburg from the Chenal Ecarte intake at the Wallaceburg Water Treatment Plant (Thames-Sydenham and Region Source Protection Committee, 2015). IPZ's are, therefore, concentrated along Lake Huron near</p> | <p>screened water intakes to limit intake of debris and organisms and energy dissipation/erosion control measures during discharge to limit erosion and sedimentation.</p> <ul style="list-style-type: none"> • To reduce the potential for erosion and scouring at discharge locations during construction dewatering and/or hydrostatic testing, energy dissipation techniques should be used. Discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking during surging. Protective measures may include dewatering at low velocities, dissipating water energy by discharging into a filter bag or diffuser and utilizing protective riprap or equivalent. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or dewatering discontinued until satisfactory mitigation measures are in place. Discharge should be monitored to make sure that no erosion or flooding occurs. • To assess the potential for introduction of contaminated water to soils or bodies of water, testing of hydrostatic and trench dewatering discharge water should be considered. Testing requirements can be influenced by the nature and quality of the source water used, any additives to the test water, the nature of the pipeline, and pipeline contents. An environmental consultant should be consulted to determine what testing is necessary for the discharge water. <p><u>Private Water Wells</u></p> <ul style="list-style-type: none"> • A private well survey should be conducted to assess domestic groundwater use near the Project and a private well monitoring program may be recommended for residents who rely on | |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--------------------------|--|---|-------------|
| | <p>Sarnia and in Wallaceburg on lands adjacent to the intake points that are greater than 15 km from the Study Area. Based on the Clean Water Act (2006), there are no significant chemical, pathogen or dense non-aqueous phase liquids source water threats to municipal supply sources based on the construction or operation of the proposed pipeline.</p> | <p>overburden groundwater supply for domestic use. This monitoring program may include pre— construction water quality monitoring as well as water level monitoring, if available. Should a private water well be affected by project construction, a potable water supply should be provided, and the water well should be repaired or restored as required.</p> <p><u>Municipal Water Supply</u></p> <p>There are no nearby municipal supply wells, and therefore additional mitigation measures are not required to protect groundwater drinking supply sources.</p> <p>During construction, the primary concern to surface water quality is the potential for a contaminant spill during a large storm event. To address this concern, the following mitigation measures are proposed:</p> <ul style="list-style-type: none"> • Refueling of equipment should be undertaken 50 m from wetlands and watercourses to reduce potential impacts to surface water and groundwater quality if an accidental spill occurs. If a 50 m refueling distance is not possible, under approval from on-site environmental personnel, special refueling procedures for sensitive areas should be undertaken that include, at a minimum, using a two-person refueling system with one worker at each end of the hose. Spill containment devices and absorbent material shall be on hand and readily available. • To reduce the impact of potential contaminant spills, the contractor should implement spill management protocols such as secondary | |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--|---|--|--|
| | | containment of any temporary fuel storage and preparation of a spill response plan. <ul style="list-style-type: none"> • Work should be limited or stopped during and immediately following significant precipitation events (i.e. 100-year storm event), at the discretion of on-site environmental personnel. | |
| Aggregates and Petroleum Resources <i>Section 4.3.4</i> | The PR parallels existing natural gas pipelines, therefore, impacts to aggregates and/or petroleum resources are not anticipated. | <ul style="list-style-type: none"> • During the detailed design phase Enbridge Gas should review available mapping to determine locations of the suspected petroleum resources. | As such, no significant adverse residual impacts on extractive resources are anticipated. |
| Soil and Soil Capability <i>Section 4.3.5</i> | <p>Temporary land use areas associated with construction activities for the proposed pipeline may interact with agricultural lands. Where there is interaction with agricultural land, there are potential impacts to topsoil as a result of construction including compaction, loss of organic matter and degraded soil structure. No topsoil will be removed from the site. Excess subsoil may be removed from the site.</p> <p>Trenching and construction activities across agricultural land have the potential to affect soil quality and agricultural capability. The movement of heavy machinery on wet soil may cause rutting, compaction, and mixing of topsoil with subsoil. When exposed, soils are more prone to erosion due to the loss of vegetative cover. Improperly salvaged topsoil can result in topsoil and subsoil mixing, compaction, rutting, and erosion, which can potentially decrease crop yields.</p> | <p><u>Excess Soil</u></p> <p>It is noted that the MECP has proposed regulating the movement of excess soils in the province of Ontario. It is recommended that Enbridge Gas retain a qualified person for environmental site assessment who is knowledgeable in the current excess soils guidelines, as well as the proposed regulation, in order to make recommendations for the management of excess soils for this project.</p> <p><u>Wet Soil Shutdown</u></p> <p>To the extent feasible, construction activities should occur during drier times of the year. Lands affected by heavy rainfall events should be monitored for wet soil conditions, to avoid the potential for topsoil and subsoil mixing and loss of structure. Construction activities should be temporarily halted on agricultural lands where excessively wet soil conditions are encountered. Enbridge Gas' on-site inspection team should determine when construction activities may be resumed.</p> <p>If a situation develops that necessitates construction during wet soil conditions, soil protection measures should be implemented, such as confining construction activity to the narrowest area practical, installing</p> | With the implementation of the mitigation and protective measures, no significant adverse residual impacts on soil or soil capability are anticipated. |



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| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--------------------------|---|---|-------------|
| | <p>Where equipment is moving from one agricultural field to another there is the potential for the spread of soil pests/diseases to previously unimpacted fields.</p> | <p>surface protection measures, and using wide tracked or low ground pressure vehicles.</p> <p><u>High Winds</u> During construction activities, weather should be monitored to identify the potential onset of high wind conditions and to preserve topsoil. In the event that high winds occur where friable soils are present, the contractor should implement protective measures such as:</p> <ul style="list-style-type: none"> • Suspend earth moving operations • Apply dust suppressants or vegetate soil stockpiles • Protect soil stockpiles with a barrier or windscreen • In conjunction with the above measures, all required materials and equipment should be readily accessible and available for use as required. <p><u>Soil Stripping</u> Topsoil depths should be measured prior to stripping so that the proper depth of topsoil is removed and replaced. Where stripping is undertaken on agricultural lands, topsoil and subsoil should be stripped and stockpiled separately to avoid mixing. Where the pipeline crosses woodlands the organic and duff layer should be stripped where feasible, given local substrate conditions. Where stripping is undertaken in woodlands, organic material and subsoil should be stripped and stockpiled separately to avoid mixing.</p> <p>If clean-up is not practical during the construction year, it should be undertaken in the year following construction, starting once the soils have sufficiently dried. Interim soil protection measures should be implemented in sensitive areas to stabilize the RoW for over-wintering.</p> | |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

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|--------------------------|---------------------|---|-------------|
| | | <p><u>Soil Compaction</u> Within agricultural lands where soil has been compacted by the construction process, an agrologist should determine where decompaction may be necessary. Compaction can be alleviated by using farm equipment such as an agricultural subsoiler prior to replacing the topsoil. Sub-soiling with an agricultural subsoiler, followed by discing, chisel ploughing and cultivating, to smooth the surface, should be considered on agricultural lands. In high traffic areas of the RoW where deep compaction persists, additional deep tillage or subsoiling may be required on a site-specific basis. Soil density and/or penetrometer measurements on and off the easement may be used as a means of assessing the relative degree of soil compaction caused by construction along the RoW as well as determining that the RoW has been sufficiently decompacted.</p> <p><u>Soil Pests/Diseases</u> In consultation with the landowner and an agrologist, Enbridge Gas should develop and implement a soil sampling plan on agricultural lands for potential pests and/or diseases that are known to the area. If the results indicate an issue or concern, in consultation with the landowner, Enbridge Gas should work with the agrologist to develop a best practice protocol.</p> <p>Any imported topsoil used for rehabilitation should also have a composite sample analyzed for identified concerns before it is placed on the easement.</p> | |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--|--|--|---|
| Agricultural Tile Drainage <i>Section 4.3.6</i> | Construction activities, including trenching and the movement of heavy machinery, have the potential to crush and/or sever agricultural tile drains. | Enbridge Gas should undertake consultation with landowners of agricultural fields to confirm where systematic tile drainage is present. If tile drainage is present, Enbridge Gas should undertake standard mitigation during trenching, including: <ul style="list-style-type: none"> • Develop site specific tile plans with an independent tile contractor • Conduct pre-tiling, and install header tile to maintain tile system function • Excavate the pipeline trench to a depth that allows clearance between the top of the proposed pipeline and the bottom of existing drainage systems • Record and flag severed or crushed tile drains • If a main drain, header drain, or large diameter drain is severed, maintain field drainage and prevent flooding of the work area and adjacent lands through temporary repairs • Cap both sides of severed drains that cross the trench to prevent the entry of soil, debris and rodents, as required • Repair damaged and severed drains following construction • After repair and before backfilling, invite the landowner to inspect and approve the repair | With the implementation of the mitigation and protective measures, no significant adverse residual impacts on agricultural tile drains are anticipated. |



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| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|---|--|--|---|
| Soybean Cyst Nematode (SCN) <i>Section 4.3.7</i> | On agricultural fields, the potential exists for SCN to be spread from an impacted field to a non-impacted field by wind, animals, water erosion, machinery, boots, etc. To minimize the risk of spreading SCN to non-impacted fields, mitigative/protective measures should be established. Since the construction will impact very little agricultural soil, the potential for the spread of SCN onto adjacent fields is negligible. | <p>Enbridge Gas should consult with landowners of agriculture fields to determine if they would like to proceed with soil sampling for SCN. If requested and agreed to by the landowner, soil sampling for SCN is recommended where construction activity is planned on agricultural crop lands. If a field is identified as having SCN, in consultation with potentially impacted landowners, the following mitigation measures should be considered:</p> <ul style="list-style-type: none"> • To the extent feasible restrict construction activity to the non-agricultural pipeline construction area. • If the pipeline route or an adjacent farm field is identified as having SCN all equipment and boots should be properly cleaned before moving to an area that has not been shown to be impacted by SCN. This may involve thorough washing before moving equipment from an impacted field to non-impacted field. • All properties impacted with SCN should be identified and communicated to the Contractor. A best practice protocol should be developed to handle SCN, with assistance from Stantec. • Any topsoil imported for clean-up activities should be analyzed for SCN by collecting a composite sample, sending it to a lab for analysis and reviewing results before any imported topsoil is placed on the easement. Imported suitable fill (not containing topsoil) or granular materials do not need to be tested for SCN. | With adherence to the best construction practices discussed in this report, no significant adverse impacts from SCN along the pipeline preferred route are anticipated. |



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|--|--|---|---|
| <p>Natural Hazards <i>Section 4.3.8</i></p> | <p>The probability of significant seismic activity in the Study Area is low; therefore, no potential impacts are anticipated.</p> <p>The likelihood of a flooding event interfering with Project construction is reduced by construction occurring outside of the spring freshet. A flooding event during construction could result in construction delays, soil erosion, sedimentation of a watercourse, trench slumping, and damage or loss of construction equipment and contamination of a watercourse as a result of equipment entering a watercourse. The nature of these impacts would depend on the spatial extent, duration, and magnitude of the flooding event.</p> | <ul style="list-style-type: none"> • If flooding necessitates a change in the construction schedule, affected landowners and regulatory agencies should be notified and construction should continue at non-affected locations. • Temporary workspaces should be located above the floodplain to the extent practical, unless necessary for watercourse crossings. • All work in the floodplain will be subject to a permit under O. Reg. 171/06 from SCRCA. | <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts from natural hazards are anticipated.</p> |
| BIOPHYSICAL FEATURES | | | |
| <p>Aquatic Features <i>Section 4.4.1</i></p> | <p>A field investigation will confirm the presence of the identified watercourse. Should the watercourse be present, there exists the potential to affect fish or mussels directly through impacts on water quality (erosion, sedimentation, and accidental spills), disruption and harassment (vibration and noise), and loss of habitat. Indirect impacts include restrictions to habitat use and fish passage. Long term impacts can include changes to habitat such as substrate, increased erosion potential, loss of in-stream cover and riparian shading.</p> | <ul style="list-style-type: none"> • Mitigation and protective measures for ESC are outlined in Section 4.3.2 and 4.3.5. • Temporary vehicle crossings and dam and pump pipeline crossings should be completed following the measures outlined in industry standards and company specifications for construction. • The following general mitigation measures, or equivalent, are recommended at watercourse crossings. Additional, activity-specific measures related to the crossing methods are provided following the general mitigation measures. All measures presented are intended to be consistent with DFO’s measures to protect fish and fish habitat (DFO 2019), but DFO’s website | <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts to aquatic features are anticipated.</p> |



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|--------------------------|---------------------|--|-------------|
| | | <p>(https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html) should be consulted immediately prior to construction to confirm that the construction plan is consistent with the most up-to-date list of DFO avoidance measures.</p> <p><u>General Mitigation Measures</u></p> <ul style="list-style-type: none"> • In-water work for warmwater habitats is typically permitted from July 1 to March 14 (no in-water work from March 15 to June 30 (MNRF 2013). Booth Creek and Bear Creek have been identified as warmwater features. All other watercourses in the Study Area will be treated as warmwater features unless field surveys determine otherwise. • Watercourses should not be obstructed in a way that impedes the free movement of water and fish. • Prior to removal of the vegetation cover, effective mitigation techniques for erosion and sedimentation should be in place to protect water quality. Disturbance to the area during construction should be limited and grubbing activities should be delayed until immediately prior to grading operations. • Soil exposure should be reduced prior to commencing construction, and the period that soil remains exposed for grading should be limited. • Exposed soils surrounding watercourses should be seeded immediately following construction. • Temporary ESC measures should be maintained and kept in place until work within or near a watercourse has been completed and stabilized. Temporary sediment control measures should be removed at the completion of the work but not until permanent erosion control measures have been established. | |



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Table 5.1: Potential Impacts and Recommended Mitigation and Protective Measures

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|--------------------------|---------------------|--|-------------|
| | | <ul style="list-style-type: none"> • Construction material, excess material, construction debris and empty containers should be stored a minimum of 15 m from watercourses and watercourse banks. • Equipment maintenance and refueling should be controlled to prevent entry of petroleum products or other deleterious substances, including any debris, waste, rubble or concrete material, into a watercourse, unless otherwise specified in the contract. • In the unlikely event of a spill, spills containment and clean-up procedures should be implemented immediately. Enbridge Gas should contact the MECP Spills Action Centre. The MECP Spills Action Centre is the first point of contact for spills at the provincial and federal level. • Additional supplies should be maintained on-site, in a readily accessible location, for maintenance and contingency purposes. Prior to construction, adequate quantities of the materials listed below, or comparable substitutions, should be on site to control erosion and sediment deposition: <ul style="list-style-type: none"> ○ Sediment control fencing ○ Sediment control logs (i.e., SiltSoxx™) ○ Straw bales ○ Wooden stakes ○ Sand bags ○ Water energy dissipater ○ Filter cloth ○ Water pumps (including stand-by pumps and sufficient lengths of hose) ○ Culvert <p><u>Flow Diversion/Dewatering</u></p> <ul style="list-style-type: none"> • If in-water works are required, the work area should be isolated from the remainder of the | |



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| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--------------------------|---------------------|--|-------------|
| | | <p>surface water feature. Downstream flows should be maintained using dam and pump techniques. When dewatering the work area, dewatering operations should be managed to prevent erosion and/or release of sediment laden or contaminated water to the waterbody (e.g. settling basin, filter bag, energy dispersion measures). An isolation/contamination plan should be designed and implemented to isolate temporary in-water work zones and maintain flow around the work zone. Maintenance of downstream flow should avoid potential upstream flooding and desiccation of downstream aquatic habitat and organisms.</p> <p><u>Fish Rescue Plan</u></p> <ul style="list-style-type: none"> • Prior to dewatering the work zone, fish trapped in the construction area should be collected and moved using capture, handling, and release techniques to reduce harm and stress. The intakes of pumping hoses should be equipped with an appropriate device to avoid entraining and impinging fish (see Interim code of practice: End of pipe fish protection screens for small water intakes in freshwater at the following DFO website https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html). Fish rescue plans should be developed on a site-specific basis and implemented by qualified professionals with the appropriate licence in place (i.e. MNRF Licence to Collect Fish for Scientific Purposes). <p><u>Site Restoration and Riparian Planting</u></p> <ul style="list-style-type: none"> • Following construction, the bed and banks of the crossing location should be restored to pre-construction conditions to the extent possible in accordance with environmental permits. Bank | |



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| Environmental Feature(s) | Potential Impact(s) | Mitigation and Protective Measures | Net Impacts |
|--------------------------|---------------------|--|-------------|
| | | <p>slopes should be restored to match existing grades; however, alterations may be made to maintain slope stability and limit future erosion. Exposed banks should be re-vegetated with native plants to provide riparian cover and aid in ESC. Stream beds should be restored to maintain slopes and tie in with existing grades. Bed material should be replaced to match pre-construction conditions.</p> <p><u>Permitting</u></p> <ul style="list-style-type: none"> • Work within SCRCA’s regulated boundary, including the potential location of the pipeline and valve site, may require a permit under O. Reg. 171/06. • The Fisheries Act (R.S.C., 1985, c. F-14) prohibits activities that result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat (s.35[1]) unless authorized by the Minister of Fisheries and Oceans Canada (DFO). The Species at Risk Act (S.C. 2002, c. 29), prohibits the killing, harming, harassing, capturing or taking of a species (s.32) or damaging or destroying the residence of a species (s.33) that is listed as extirpated, endangered or threatened. For federally regulated aquatic species, these activities may be permitted through a Species at Risk Act (SARA) Permit, issued by DFO. The above prohibitions apply to activities that occur in or near waterbodies that support fish and fish habitat and/or aquatic species at risk protected under the SARA. • If in-water works (i.e., open cut, dam and pump) are expected, a consultation with DFO may be required. | |



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| <p>Designated Natural Areas and Vegetation <i>Section 4.4.2</i></p> | <p>The Study Area crosses woodlands. A field program will be developed and completed during the 2022 growing season to document the presence of designated natural areas and vegetation characterization within the Study Area.</p> <p>Where there is natural vegetation within or adjacent to the project components, potential impacts include the removal of native vegetation, introduction or spread of invasive species, and indirect effects such as dust, erosion, and accidental spills.</p> | <ul style="list-style-type: none"> • Clearing should be minimized to the extent possible in sensitive areas such as Significant Woodlands, deer wintering area, unevaluated wetlands and along Bear Creek, and in areas of significant groundwater recharge. • The limits of clearing should be surveyed and staked in the field, to allow for the protection of off-site natural areas and vegetation. • Brush and trees should be felled into the project footprint. • Clearing should be done during dry soil conditions to the extent practical to limit disturbance to vegetation and terrain. • Standard ESC measures are recommended where work should occur within 30 m of wetland communities and/or watercourse crossings. • Clearing should be completed in accordance with the municipal tree clearing by-law. • A screening field program of wetlands and riparian areas should be undertaken prior to construction, to determine where precautionary measures (ex. equipment washing before site access) may be necessary to mitigate for the spread of non-native species. • Work within a wetland, including the potential location of the pipeline and valve site, may require permitting discussions with the SCRCA under O. Reg. 171/06. • Should significant Phragmites stands be identified during field investigations, a Phragmites management plan should be developed. • A re-vegetation program should be developed and implemented for all vegetated temporary work areas. Enbridge Gas should consult with landowners and SCRCA to confirm replanting plans. | <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts on designated natural areas and vegetation are anticipated.</p> |



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|---|--|---|--|
| | | <ul style="list-style-type: none"> • Seeding of the disturbed temporary work areas and the permanent easement should be done with a native seed mix approved by SCRCA. Replaced soils should contain native seed bank, facilitating successful revegetation. • One year following construction, planted vegetation should be inspected for survival; in areas of severe dieback, dead and diseased planted vegetation should be replaced. • Mitigation and protective measures for dust are outlined in Section 4.3.5, for erosion in Section 4.3.2, and for accidental spills in Sections 4.3.3 and 4.4.1. | |
| <p>Wildlife Habitat, Wildlife, and Species at Risk <i>Section 4.4.3</i></p> | <p>The presence of woodlands, unevaluated wetlands, Bear Creek, and open habitats potentially provide SAR habitat. A field program will be developed and completed during the 2022 growing season to document the presence of significant wildlife habitat and SAR habitat in the Study Area.</p> <p>Potential impacts on wildlife and wildlife habitat from construction include direct mortality from construction vehicles and/or adults abandoning young due to disturbance, habitat destruction through vegetation removal, habitat degradation through spills and sensory disturbance.</p> | <ul style="list-style-type: none"> • Detailed design of the project components should be reviewed to avoid and reduce the likelihood of impact upon wildlife habitat to the extent possible, and in particular habitats of endangered, rare, special concern, and threatened species. • Speed limits should be lowered along the construction ROW where field investigations identify specific wildlife concerns. • On-site personnel should be informed of the potential presence of the SAR and/or SOCC identified in the Study Area, obligations under the ESA (Government of Ontario 2007), and recommended actions in the event of an encounter. • Equipment and vehicles should yield the ROW to wildlife. • Trench operations should be followed as closely as practical with backfill operations, to facilitate the movement of wildlife across the trench. • Gaps in stockpiles should be created, in consultation with a biologist, to allow for the potential movement of wildlife across the ROW. | <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts on wildlife habitat, wildlife and SAR are anticipated.</p> |



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|--------------------------|---------------------|--|-------------|
| | | <ul style="list-style-type: none"> • Fencing should be erected around deep excavations to prevent wildlife entrapment. • The contractor should inform their personnel to not threaten, harass or injure wildlife. • If wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site. • Where practical, avoid construction in the vicinity of areas that may provide habitat for amphibians during the amphibian breeding season (March 1 – June 30). Amphibian habitat will be identified during 2022 field investigations. • Habitat assessments and species occurrence surveys will be conducted for SAR. A report will be prepared to document results and recommend mitigation measures. • Field investigations will identify potential habitat for Eastern Foxsnake and Butler’s Gartersnake, which are known to occur in the area. Mitigation recommendations will be prepared upon consultation with the MECP and will include the use of timing windows, inspection of construction equipment and protection of key habitat features. Mesh or netting type stabilization material will not be used for erosion control due to risk of entanglement. • Areas of potential bat maternity roosting habitat will be identified during 2022 field investigations. Tree removal in identified areas should be limited to the extent possible and will avoid the active season for bats (April 1 to October 1). Mitigation recommendations for SAR bats will be prepared upon consultation with MECP. • Construction activities with the potential to remove migratory bird habitat, such as vegetation clearing, | |



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| | | <p>should be avoided during the breeding season which is generally from April 1- August 31 in southern Ontario (Environment Canada, 2020). Should vegetation clearing activities be unavoidable during this window, a mitigation program should be developed, which includes measures to reduce and avoid impacts to migratory birds and their nests. This program should include preventative and mitigation measures but may also include avoidance of clearing during key sensitive periods and in key locations.</p> <ul style="list-style-type: none"> • If SAR are found in the Study Area Enbridge Gas will undertake consultation with the MECP to identify species specific mitigation and/or permitting requirements under the ESA. • Any SAR individual that is incidentally encountered in the Study Area must be allowed to leave of its own accord. Activities within 20 m should cease until the individual disperses. Construction machinery/equipment must maintain a minimum operating distance of 20 m from the individual until it disperses from the work zone of its own accord. • Should on-site personnel be unable to allow an incidentally encountered SAR individual to disperse from the active construction area under its own ability, measures developed in consultation with MECP will be implemented. • Any SAR individual that is encountered in the work zone should be reported to the MECP staff in 48 hours of the observation or the next working day, whichever comes first. • If an injured or deceased SAR is found, the specimen must be placed in a non-airtight container that is maintained at an appropriate | |



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|---|---|---|--|
| | | <p>temperature and MECP must be contacted immediately for additional guidance.</p> <ul style="list-style-type: none"> Mitigation and protective measures for vegetation removal are outlined in Section 4.4.2, and for accidental spills in Sections 4.3.3 and 4.4.1. | |
| SOCIO-ECONOMIC ENVIRONMENT | | | |
| Demographics <i>Section 4.5.1</i> | No impacts to community demographics are anticipated as a result of the proposed Project. | <ul style="list-style-type: none"> As no impacts to community demographics are anticipated, no mitigation or protective measures are recommended. | As no impacts are anticipated, no net impacts will occur. |
| Employment and Business <i>Section 4.5.2</i> | <p>Project demands for labour and goods and services can result in both beneficial and adverse effects. Positive effects may not be evenly distributed among populations, with some residents in a better position to receive economic benefits than others. Similarly, adverse effects may affect some residents more than others. Residual effects on employment are related to the project's labour demand compared to the labour supply. Three types of employment are considered:</p> <ul style="list-style-type: none"> Direct employment: labour that is hired directly for the project Indirect employment: labour hired by companies in order to produce and provide goods and services needed for the project Induced employment: labour hired by industries that produce and provide consumer items and services purchased by people who are directly or indirectly employed by the project | <p>It is expected that the project will generally result in positive effects on employment by employing local and Indigenous people, and by reducing the unemployment rate in the region. These positive effects do not require mitigation, but Enbridge Gas should identify and implement various mechanisms to enhance project benefits.</p> <p>The potential effects of the project as a result of purchasing labour, goods and services is expected to be positive during construction and operation, so no mitigation will be required. However, Enbridge Gas has and will continue to work with local and Indigenous businesses to enhance their potential for successfully bidding on project contracts regarding the supply of goods and services, particularly for the operation phase. One initiative to help encourage further local and Indigenous content on the project is to post project purchasing requirements in advance, so that businesses can position themselves to effectively bid to supply goods and services needed for construction and operation. Increased participation of local and Indigenous businesses will enhance positive local economic effects.</p> <p>With respect to potential adverse effects on agricultural and non-agricultural businesses, Enbridge Gas should</p> | <p>With the above initiatives to encourage local and Indigenous participation on the Project, it is anticipated that the effects from project on employment and business will be positive, including creating positive economic activity through new direct, indirect, and induced employment. Project expenditures on local businesses and suppliers also have the potential to positively affect the local economies.</p> <p>Consultation with residents, businesses and landowners will address any concerns to their operations.</p> <p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts on Employment and Business are anticipated.</p> |



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|---|---|---|--|
| | <p>Labour conditions will be affected by direct, indirect and induced employment during all project phases.</p> <p>The project could affect business through purchases of labour, goods and services from local businesses, including businesses owned by Indigenous peoples, and will result in increased local employment income and municipal government revenue. Local businesses will likely benefit from supplying the project with goods and services.</p> <p>Land clearing and other construction-related project activities could adversely affect agricultural productivity. Other potential adverse effects on industries include impairment to the use and enjoyment of property, disruption of livestock production and issues with farm machinery and other vehicular movement.</p> | <p>engage with landowners and municipalities to address access to the project area, the portion of land that will be altered as part of site preparation, and long-term changes to agricultural and non-agricultural land.</p> | |
| <p>Community Services and Infrastructure <i>Section 4.5.3</i></p> | <p>The presence of temporary workers in the local communities during the construction period has the potential to increase the demand for housing and local community services and infrastructure. Non-local project workers are expected to stay in temporary accommodations, including hotels, motels, and campgrounds. As there are limited temporary accommodations available within or adjacent to the Study Area, it is anticipated that non-local project workers will stay in</p> | <p>Project employees might require medical attention while staying in the area. The contractor and Enbridge Gas should have emergency response equipment and trained personnel on-site during construction. In addition, an Emergency Response Plan will be developed and implemented, which will address field health services, emergency call-out procedures and fire response plans. Safety fencing will be used where necessary to separate the work area.</p> <p>Environmental mitigation will be in place to reduce the likelihood of emergency events and to prepare for the management of emergency events on site. If an</p> | <p>Community services and infrastructure appear to have additional capacity to absorb potential increased temporary demands that may result from the project. Adverse effects on traffic will be minimal because the preferred pipeline route intersects mainly rural communities where roads currently have low levels of</p> |



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| | <p>accommodations closer to larger towns and cities, such as the City of Sarnia. Non-local project workers may also choose to rent cottages or apartments. The vacancy rate for temporary rentals will likely be able to accommodate the temporary increase. The short duration that the workers will reside near any one community, as well as the structure of the work shifts, will limit the need for workers to use the services and infrastructure in local communities.</p> <p>The transportation of project goods, services and workers has the potential to lead to increased use of existing transportation infrastructure. Also, increased traffic volumes along local road networks could increase travel times and reduce road safety, which might lead to increased use of local emergency services due to potential vehicle accidents and workplace accidents. In addition, the production of project-related waste could place additional stress on the capacity of local landfills.</p> <p>During operation, the workforce will remain the same as current operations with no planned changes as the project is a replacement of the existing pipeline. Some operation workers might already reside in the local area; however, some might need to come from outside communities and may use local community and emergency services.</p> | <p>emergency incident were to occur, it is anticipated that the comprehensive mitigation, contingency plans, and safety strategies will result in a localized and low-intensity response.</p> <p>A Traffic Management Plan will be in place for all roads affected by construction, which at a minimum outlines measures to:</p> <ul style="list-style-type: none"> • Control the movement of materials and personnel to and from the construction site • Post signs to warn oncoming motorists of construction activity • Control traffic at road crossings • Reduce on-road disturbance and land closures • Store equipment as far from the edge of the road as practical • Install construction barricades at road crossings <p>Traffic disruptions during construction will be reduced by adherence to the Traffic Management Plan. Guidelines will be developed for vehicular use on the RoW and associated access roads to avoid traffic congestion and accidents. Access to existing transportation infrastructure will be addressed through standard mitigation and will be reversible once the construction phase ends.</p> <p>The capacity of waste disposal sites will be considered and if project needs are not easily accommodated, alternative disposal locations will be considered.</p> <p>Enbridge Gas should provide project information to local communities and service providers so that they are prepared for any possible demand on community services and infrastructure related to a temporary population increase. Additional consultation with residents and businesses adjacent to the preferred pipeline route will be held in advance of construction commencement to discuss potential specific impacts to</p> | <p>traffic and alternative routes are readily accessible.</p> <p>Given the available capacity of the local community services and infrastructure, along with the implementation of the mitigation and protective measures, no significant adverse residual impacts on community services and infrastructure are anticipated.</p> |



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| | | the property or business. Contact information for a designated Enbridge Gas representative should be available to address questions and concerns during construction. Consultation has been initiated and should continue with municipal personnel. | |
| Culture, Tourism and Recreational Facilities <i>Section 4.5.4</i> | Cultural, tourism, and recreational facilities may experience noise, dust, and equipment exhaust associated with construction activity. Construction activities will temporarily affect the aesthetic landscape of the construction area and could impede property access. Potential safety concerns also exist at locations where properties, visitors, and vehicles come close to construction activities. | It is recommended additional consultation with residents and businesses adjacent to the preferred pipeline route occur in advance of construction commencement. Contact information for a designated Enbridge Gas representative should be available prior to and during construction to address questions and concerns. While pipeline construction activities and machinery have the potential to temporarily affect street aesthetics, restoration of the construction area will leave little evidence that a pipeline exists. Construction should be conducted as expeditiously as possible, to reduce duration of activities. Vegetative buffers at watercourse and road crossings should be restored where feasible. Access to businesses and residential properties should be maintained always. If required, signs should be used to direct people to correct access. Safety fence should be installed at the edge of the construction area where public safety considerations are required. A traffic management plan should be implemented for all roads affected by construction, which at a minimum outlines measures to: <ul style="list-style-type: none"> • control the movement of materials and personnel to and from the construction site • post signs to warn oncoming motorists of construction activity • control traffic at road crossings • reduce on-road disturbance and land closures | With the implementation of the mitigation and protective measures, no significant adverse residual impacts on cultural, tourism, and recreational facilities are anticipated. |



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|---|---|--|--|
| | | <ul style="list-style-type: none"> • store equipment as far from the edge of the road as practical • install construction barricades at road crossings | |
| Air Quality and Noise <i>Section 4.5.5</i> | Residential and business properties may experience noise, dust and equipment exhaust associated with construction activity. During operation, no substantial air or noise emissions are anticipated to occur. | During construction, motorized construction equipment should be equipped with appropriate mufflers and silencers as available. Company and construction personnel should avoid excessive idling of vehicles; vehicles and equipment should be turned off when not in use unless required for operation. To the greatest extent practical, activities that could create noise should be restricted to daylight hours and adhere to local noise by-laws. Sources of continuous noise, such as portable generators, should be shielded or located so as to reduce disturbance to residents and businesses. The contractor should implement site practices during construction that are in line with the Environment Canada document 'Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities' (Cheminfo Services Inc., 2005), which may include: <ul style="list-style-type: none"> • Maintaining equipment in compliance with regulatory requirements • Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and dust • Dust suppression of source areas • Covering loads of friable materials during transport • Watering for dust control must not result in the formation of puddles, rutting by equipment or vehicles, the tracking of mud onto roads or the siltation of watercourses. | With the implementation of the mitigation and protective measures, no significant adverse residual impacts from air quality and noise are anticipated. |



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| Land Use Designations <i>Section 4.5.6</i> | Natural gas pipelines and their associated facilities/structures are permitted land uses, and therefore no impacts are anticipated. | <ul style="list-style-type: none"> As no impacts to land use designations are anticipated, no mitigation or protective measures are recommended. | As no impacts are anticipated, no net impacts will occur. |
| Landfills and Contaminated Sites <i>Section 4.5.7</i> | <p>Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources on and off the construction RoW. Litter generated during construction may also become a nuisance to adjacent properties if not contained.</p> <p>The PR is not expected to cross or be in the vicinity of lands that may have contaminants of concern, however the application of road salt for de-icing activities along the roadways within the Study Area represent a potential source of contamination.</p> <p>The removal of structures during construction is not anticipated, therefore, the potential presence of building materials of concern, such as asbestos, lead, and silica, related to structures in the investigated area (i.e., within privately owned buildings, concrete culverts, bridge decks, etc.) was not confirmed, as an assessment of structures was not completed.</p> | <p>All construction wastes should be disposed of in accordance with LUG C&M 2020. Additionally, Enbridge Gas should undertake responsible management of excess fill. When details on excess fill volumes are known, disposal locations should be determined, and appropriate permitting obtained.</p> <p>A site-specific waste collection and disposal management plan should be implemented, which may include:</p> <ul style="list-style-type: none"> Waste materials, sanitary waste, and recycling transported off-site by private waste contractors licensed by the MECP. Contractors required to remove their excess materials from the site. Labelling and storage of hazardous and liquid wastes in a secure area that would contain material in the event of a spill. Implementation of a waste management program consisting of reduction, reuse, and recycling of materials. Based on the review of potentially contaminated sites in the Study Area, the following recommendations are provided: Should contaminated soils be encountered during construction, Enbridge Gas should implement their Suspect Soils Program (see LUG C&M 2020 for further details). Should excess soil be generated on-site during construction activities that will require off-site management, or if contaminated soils are suspected (e.g., if observed material contains | With the implementation of the mitigation and protective measures, no significant adverse residual impacts from landfills and contaminated sites are anticipated. |



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|--|---|---|---|
| | | <p>anthropogenic substances, petroleum hydrocarbons odours/staining, and debris/waste), representative soil samples should be collected in accordance with O. Reg. 406 /19, and submitted for chemical analysis to determine management options and-appropriate handling and health and safety guidelines.</p> <ul style="list-style-type: none"> • Soils that cannot be reused on site may be reused off-site in accordance with O. Reg. 406/19. • A Phase I ESA, and Phase II ESA (if recommended as part of the Phase I ESA) should be considered for any property that will be acquired by Enbridge Gas and a site-specific evaluation of PSOCs should be completed. If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition. | |
| <p>Archaeological Resources <i>Section 4.5.8</i></p> | <p>The Stage 1 AA has determined that the majority of the Study Area retains potential for the recovery of archaeological resources. Smaller portions of the Study Area has either been previously assessed, previously disturbed, or does not retain archaeological potential.</p> | <ul style="list-style-type: none"> • Based on the findings of the Stage 1 AA, Stage 2 AA is required. • The results of the Stage 2 AA will provide recommendations for further assessment, protection, and mitigation of archaeological resources. Where feasible for the project, archaeological sites that are determined to retain further cultural heritage value and interest should be mitigated in whole or in part by avoidance and protection/preservation measures. Where avoidance and protection/preservation measures are not feasible, archaeological resources may be mitigated in whole or in part by excavation. • For Indigenous archaeological resources retaining further cultural heritage value or interest and which may be subject to impact by the Project, Stage 3 AA and Stage 4 archaeological mitigation options will be evaluated in discussions with interested Indigenous communities. | <p>With the implementation of the AA and mitigation measures, including avoidance and protection/preservation (where feasible) and excavation, no significant adverse residual impacts on archaeological resources are anticipated.</p> |



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| Cultural Heritage Resources <i>Section 4.5.9</i> | The completion of the Checklist included the identification of five indicators of CHVI. Given the findings of the Checklist, it is recommended that additional technical studies are required. Specifically, a Cultural Heritage Assessment Report (CHAR) is required prior to Project construction. | If required, prior to construction, the above-referenced CHAR will be undertaken and submitted to the MHSTCI for their review and comment. The CHAR will contain mitigation measures for potential impacts, if required. | With the implementation of the mitigation and protective measures, no significant adverse residual impacts on heritage resources or cultural heritage landscapes are anticipated. |
| Indigenous Interests <i>Section 4.5.10</i> | The project may affect traditional territories of Indigenous communities, and during construction harvesting and hunting in the construction RoW could be impeded. Archaeological surveys could also result in the finding of Indigenous artifacts. Potential permits and approvals required for the project (see Section 1.2.5) may trigger a duty to consult. | Enbridge Gas has sought input from the identified Indigenous communities and will continue engaging with Indigenous communities as the Project moves forward. Enbridge Gas will also continue to work with their respective Economic Development departments and Enbridge Gas’s contractors to find opportunities for their participation in providing goods and services during construction. Information on the current state of Indigenous engagement will be provided in the application to the OEB. | By undertaking the engagement and archaeological assessments, no significant adverse residual impacts on Indigenous interests are anticipated. |



6.0 CUMULATIVE EFFECTS ASSESSMENT

The recognition of cumulative effects assessment as a best practice is reflected in many regulatory and guidance documents. Regarding the development of hydrocarbon pipelines in Ontario, the *OEB Environmental Guidelines* (2016) notes that cumulative effects should be identified and discussed in the ER.

Building upon the intent of the *OEB Environmental Guidelines* (2016), the OEB has specified that only those effects that are additive or interact with the effects that have already been identified as resulting from the project are to be considered under cumulative effects. In such cases, it will be necessary to determine whether these effects warrant mitigation measures. The cumulative effects assessment has been prepared with consideration of this direction from the OEB.

6.1 METHODOLOGY

The cumulative effects assessment describes the potential cumulative effects resulting from the interaction of residual effects of constructing and operating the proposed pipeline with the effects of other unrelated projects. The other projects assessed are those that are either existing or approved and that have a high likelihood of proceeding.

Cumulative effects include the temporal and spatial accumulations of change that occur within an area or system due to past, present, and future activities. Change can accumulate in systems by either an additive (i.e., cumulative) or interactive (i.e., synergistic) manner. Positive residual effects have not been assessed in the cumulative effects assessment.

By applying the principles of avoidance, minimization, and compensation to limit project-specific effects, potential adverse residual effects on environmental and socio-economic features have been greatly limited before accounting for the effects of other unrelated projects.

The cumulative effects assessment methodology is designed to evaluate and manage the additive and interactive effects from the following sources:

- Existing infrastructure, facilities, and activities as determined from available data sets
- The proposed Project
- Future activities where the undertaking will proceed, or has a high probability of proceeding

Although rare in occurrence, it is plausible that accidents or emergency events may arise due to an unforeseen chain of events during the project's construction or operational life. Due to the rarity and magnitude of such events, they have not been assessed here, as they are extreme in nature when compared to the effects of normal construction and operation activities and require separate response plans.



6.2 STUDY BOUNDARIES

Spatial

To make assumptions about the magnitude and probability of effects, an approximate 100 m boundary around the proposed pipeline route was used for the cumulative effects assessment. The 100 m boundary has been found, through previous experience with pipeline construction, to be appropriate for the most commonly encountered net effects.

Temporal

The temporal boundaries for the cumulative effects assessment reflect the nature and timing of project activities, and the availability of information surrounding future projects with a high probability of proceeding. The project schedule identifies three key milestone activities:

1. ER and technical design – 2021
2. Construction – 2023
3. Operation and Maintenance – 2024 to 2074*

**Fifty years of operation is used as an assumption, although the pipeline may be operational beyond fifty years.*

Based upon these milestone activities, two time periods were selected for evaluation: 2023 and 2028. The year 2023 was selected to represent the construction period, and the year 2028 was selected to represent the operation and maintenance period. Forecasting beyond 2028 increases the uncertainty in predicting whether projects will proceed, and the effects associated with these projects.

6.3 PROJECT INCLUSION LIST

The project inclusion list was developed by reviewing publicly available information for projects and activities with the potential for effects to interact with the identified effects of the proposed pipeline within the spatial and temporal study boundaries. The following resources were reviewed:

- Impact Assessment Agency of Canada, Canadian Impact Assessment Registry (IAAC, 2021)
- Government of Ontario, Environmental Assessment Projects by Category (Government of Ontario, 2021)
- MTO, Ontario's Highways Program Interactive Map (2016-2024) (MTO, 2020)
- Canadian Energy Regulator, Major Facilities Applications (CER, 2021)
- County of Lambton, 2021-2025 Roads Construction Program (County of Lambton, 2019b)
- OEB Applications Currently Before the Board (facilities applications only) (OEB, 2021)

Based on the review of publicly available resources, the project inclusion list in Table 5.1 included the following projects for consideration of cumulative effects:



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Table 6.1: Project Inclusion List for Cumulative Effects

| Project Name | Project Location | Proponent | Schedule | Project Description | Interaction with the Proposed Project |
|---------------------------------|---|-------------------|-----------|---|--|
| County Road 26 (Mandaumin Road) | County Road 80 (Courtright Line) to County Road 14 (Churchill Line) | County of Lambton | 2022-2025 | Pavement recycling, resurfacing and drainage improvement along County Road 26 (Mandaumin Road). | The proposed road works along Country Road 26 occur within the project Study Area. |

*The projects referenced are more than 100 m away however are large in magnitude and therefore have been included in this assessment to be conservative.

In addition to the above, it is assumed that on-going improvements, upgrades and maintenance to municipal infrastructure such as bridges, culverts, drains or roads will occur within the spatial and temporal study boundaries.

6.4 ANALYSIS OF CUMULATIVE EFFECTS

The ER considers the potential impacts of the project on specific features and conditions and proposes mitigation and protective measures to eliminate or reduce the potential impacts. The cumulative effects assessment evaluates the significance of residual impacts (after mitigation) of the project along with the effects of other unrelated projects.

6.4.1 Construction – Year 2023

Residual project impacts which may occur during project construction are outlined in Sections 4.3-4.5 to consider the additive and interactive effects at their maximum intensity, the cumulative effects assessment assumes that construction of other unrelated projects and the proposed pipeline construction will occur concurrently.

Potential cumulative effects resulting from the proposed pipeline construction and the concurrent projects are additive effects on soil, vegetation, wildlife and wildlife habitat, air quality and the acoustic environment.

Soil

Soil erosion and reduced soil capability is a potential residual effect associated with construction of the project. Mitigation and protective measures for soil are outlined in Section 4.2.2. Provided that concurrent projects follow mitigation measures similar to those outlined in this report, the probability of erosion control failure occurring concurrently is low and based on the nature of the proposed projects the magnitude of such an event would be low. As such, adverse cumulative residual effects on the natural environment from erosion are not anticipated to be significant, and cumulative effects on soil capability are not anticipated to occur.



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Vegetation

Where there is natural vegetation within or adjacent to the proposed pipeline route, potential impacts include the removal of native vegetation, and indirect effects such as dust, erosion, and accidental spills. However, with the implementation of the mitigation and protective measures outlined in this report, such as 1:1 vegetation replanting, and provided that concurrent projects follow mitigation measures similar to those outlined in this report, adverse cumulative residual effects on vegetation are not anticipated to be significant.

Wildlife and Wildlife Habitat

Potential residual effects on wildlife and wildlife habitat associated with construction of the project are accidental direct mortality, habitat removal and sensory disturbance. Mitigation and protective measures for wildlife and wildlife habitat are outlined in Section 4.3.3. In the event of project-related wildlife deaths, the NDMNRF should be contacted. If mortality occurs between concurrent projects for similar species, the Ministry will be able to note the occurrences and coordinate with Enbridge Gas to adjust construction activities. Potential cumulative effects resulting from sensory disturbance (i.e., noise, air pollution and dust) are discussed below.

Provided that the above measures are undertaken, and provided that concurrent projects follow mitigation measures similar to those outlined in this report, adverse cumulative residual effects on wildlife and wildlife habitat should be of low probability and will be mitigated as coordinated through the MECP, and therefore are not anticipated to be significant.

Air Quality and Acoustic Environment

Potential residual effects on air quality associated with construction of the project and concurrent projects are an increase in noise and air pollutants from operation of vehicles and equipment, and an increase in dust from construction activities. Mitigation and protective measures for air quality and the acoustic environment are outlined in Section 4.4.5. Provided that the concurrent projects follow mitigation measures similar to those outlined in this report, cumulative effects should be of low magnitude and reversible. Therefore, adverse residual cumulative effects on air quality and the acoustic environment are not anticipated to be significant.

6.4.2 Operation and Maintenance – Year 2024-2074

Development and maintenance activities which have a probability of proceeding during operation and maintenance of the project include:

- Road works: Future road rehabilitation and resurfacing
- Water works: Future installation of water and wastewater pipelines
- Pipeline construction and maintenance: Future pipeline construction and maintenance of existing hydrocarbon pipelines



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Operation and maintenance activities undertaken by Enbridge Gas should be completed in co-ordination with the Enbridge Gas Environmental Planning Team and will consider potential impacts on natural heritage and socio-economic environment. Appropriate mitigation measures should be developed and implemented based on the proposed maintenance work. Enbridge Gas should obtain all necessary agency permits and approvals, as required. Given the limited scale of impact of any potential operation and maintenance activities, it is anticipated that residual impacts will be minimal and that should any interaction occur with other projects, significant adverse residual effects are not anticipated to be significant.

6.5 SUMMARY OF CUMULATIVE EFFECTS

The potential cumulative effects of the project were assessed by considering development that has a high probability of proceeding just prior to or concurrent with construction of the project. An approximate 100 m boundary around the project site was used to assess the potential for additive and interactive effects of the project and other developments on environmental and socio-economic features.

Municipal projects may contribute to cumulative effects within the study boundaries. Improvements to municipal infrastructure such as bridges, culverts, drains or roads may occur during the operational phase of the project. The cumulative effects assessment determined that, provided the mitigation and protective measures outlined in this report are implemented and that concurrent projects implement similar mitigation and protective measures, potential cumulative effects are not anticipated to occur, or if they do occur are not anticipated to be significant.



7.0 MONITORING AND CONTINGENCY PLANS

7.1 MONITORING

The primary objective of compliance and effects monitoring is to check that mitigation and protective measures are effectively implemented and to measure the impacts of activities associated with construction on environmental and socio-economic features. Ultimately, the knowledge gained from monitoring is used to avoid or reduce issues which may arise during construction of subsequent pipeline projects.

Previous pipeline construction experience, and a review of post-construction monitoring reports from other projects, indicates that impacts from pipeline construction are for the most part temporary. The mitigation and protective measures to eliminate or reduce impacts are well known and have been shown to be effective. Enbridge Gas should adhere to the following general monitoring practices:

- Trained personnel should be on-site to monitor construction and should be responsible for checking that the mitigation and protective measures and monitoring requirements in the ER are executed. Enbridge Gas should implement an orientation program for inspectors and contractor personnel to provide information regarding Enbridge Gas' environmental program and commitments, as well as safety measures.
- Recommendations and commitments made in this ER and other applicable permits and reports should be incorporated into an Environmental Protection Plan (EPP) detailing construction activity. The EPP should also include site and feature specific mitigation. The EPP should become part of the contract specification with the contractor selected to construct the project, as noted in section 5.8.4 of the OEB Environmental Guidelines (2016).
- A walking inspection of the entire pipeline route should be done approximately one year after construction to determine whether areas require further rehabilitation or as required by OEB conditions of approval.

The following sections list specific environmental monitoring activities recommended for the Project.

7.1.1 Water Wells

Before construction, a private well survey should take place to assess domestic groundwater use near the Project and determine the need for a well monitoring program, as outlined in Table 5.1.

7.1.2 Exposed Soils

Monitoring of potential effects on exposed soils should occur during construction by Enbridge Gas's on-site inspection team. Restored bank slopes should be inspected one year after construction for erosion, and restoration measures should be implemented as necessary.



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7.1.3 Watercourse Crossings

Watercourse crossings have the potential to affect fish, fish habitat, and water quality. Enbridge Gas' on-site inspection team should oversee all watercourse crossings and confirm that work is conducted as outlined as per relevant permits and as per mitigation outlined in Table 5.1.

7.1.4 Vegetation

For at least one year after construction, planted vegetation should be inspected for survival. Dead and diseased vegetation should be replaced in areas of severe dieback or in areas with important environmental functions (e.g. riparian or slope cover).

7.1.5 Species at Risk

Should SAR be identified during field investigations, construction monitoring may need to be undertaken. The exact nature of monitoring will be determined in consultation with the MECP and DFO and will depend on the species present.

7.1.6 Cultural Heritage Resources

Any cultural heritage resources within 50 m of the proposed pipeline route will require site plan controls that will need monitoring. In addition, if a vibration assessment results in additional mitigation measures, these will need to be monitored where construction activities occur within 50 m of a cultural heritage resource. Further details are provided in Section 4.4.10.

7.1.7 Residents and Businesses

Construction activities may impact directly affected landowners and surrounding residents and businesses. During construction, a designated Enbridge Gas representative should be available to monitor and respond to requests and concerns voiced by residents and business owners. Landowners affected by construction should be notified in advance of construction activities in their area, as feasible. The notification should provide the contact information for a designated Enbridge Gas representative.

Enbridge Gas's on-site inspection team should also monitor the contractors' implementation of the Traffic Management Plan (TMP), to see that site access to residences and businesses has been maintained and that traffic is not being unnecessarily interrupted.

While efforts will be undertaken to reduce impacts, a comment tracking system should also be implemented. An Enbridge Gas representative should record the time and date of calls, the nature of the concern, the corrective action taken, and the time and date of follow-up contact.

Following completion of construction, Enbridge Gas should contact residents and businesses along the easement to continue ongoing communications where necessary. During the first two years, particular attention should be paid to monitoring and documenting impacts associated with construction of the proposed pipeline.



7.2 CONTINGENCY

Contingency planning is necessary to prevent a delayed or ineffective response to unexpected events or conditions that may occur during construction of the Project. An essential element of contingency planning is the preparation of plans and procedures that can be implemented if unexpected events occur. The absence of contingency plans may result in short or long term environmental or socio-economic impacts and possibly threaten public safety.

The following unexpected events require contingency planning during construction: adverse weather causing watercourse sedimentation, human error causing accidental spills, and the discovery of unexpected finds. Although unexpected problems are not anticipated to occur during construction, Enbridge Gas and the pipeline contractor should be prepared to act when unexpected events occur. Construction personnel should be made aware of and know how to implement contingency measures.

7.2.1 Watercourse Sedimentation

Properly installed ESC measures are designed to minimize the risk of sediment laden runoff being transported towards watercourses and other natural heritage features. Extreme runoff events could result in collapse of silt fencing, overflow or bypass of barriers, slope or trench failures, and other problems which could lead to sedimentation of watercourses.

If sedimentation occurs, immediate action should be taken to repair dysfunctional ESC features or install temporary measures that will contain the erosion as quickly as practical. When site conditions permit, permanent protection measures should be installed on erosion-susceptible surfaces. The source of sedimentation and degree of impact should be examined when conditions permit. If erosion and sedimentation results from a construction-related activity, the activity should be halted immediately until the situation is rectified.

7.2.2 Accidental Spills

During construction, an accidental spill of fluids may occur. The impact of the spill will depend upon the magnitude, extent, and nature of the spill and the environmental and socio-economic conditions in which it takes place. Upon release of a hydrocarbon-based construction fluid, Enbridge Gas should immediately determine the magnitude and extent of the spill and rapidly take measures to contain it. Release of sediment should also be treated as a spill depending on the magnitude and extent. Spills should be immediately reported to Enbridge Gas' on-site inspection team. If necessary, the MECP Spills Action Center should be notified at 1-800-268-6060.

A Spills Response Plan should be developed, reviewed with personnel, and posted in site trailers. Spill containment equipment should be readily available, especially near watercourses. Personnel should be trained in the use of spill containment equipment.

Should a spill occur in the project area the spill response contingency plan should be implemented. Specifics of the contingency plan should be documented on site.



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7.2.3 Unexpected Finds: Archaeological or Heritage Resources and Unknown Contaminated Soils

Should previously unknown archaeological or heritage resources be uncovered or suspected of being uncovered during construction, ground disturbance in the find location should cease immediately. The MHSTCI and an archaeologist licensed in the Province of Ontario should be notified immediately. A site-specific response plan should then be employed following further investigation of the specific find. The response plan would indicate under which conditions the ground disturbance activity in the find location may resume.

In the event that human remains are uncovered or suspected of being uncovered during ground disturbance, the above measures should be implemented along with notifying local police, the coroner's office, and the Cemeteries Regulation Unit of the Ontario Ministry of Government and Consumer Services (1-800-889-9768).

In the event that previously unknown materials or contaminated soils are uncovered or suspected of being uncovered, construction in the find location should cease immediately. In such an instance, Enbridge Gas should retain expert advice on assessing and developing a plan to include soil sampling, handling, disposal and remediation.



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8.0 CONCLUSION

The environmental study investigated data on the physical, biophysical, and socio-economic environment along the proposed pipeline route and related facilities. In the opinion of Stantec, the recommended program of supplemental studies, mitigation and protective measures, and contingency measures are considered appropriate to protect the features encountered. Monitoring will assess whether mitigation and protective measures were effective in both the short and long term.

With the implementation of the recommendations in this report, on-going communication and consultation, and adherence to permit, regulatory and legislative requirements, potential adverse residual environmental and socio-economic impacts of the project are not anticipated to be significant.



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