5 PROJECT INTERACTIONS WITH THE ENVIRONMENT

This section of the ESEIA provides an assessment of predicted environmental and socio-economic effects of the Project. Potential interactions between the Project and Valued Ecosystem Components ("VEC") and Valued Socio-economic Components ("VSC") ("Valued Components") including air quality and greenhouse gas ("GHG") emissions, acoustic environment, water resources, fish and fish habitat, soils and soil productivity, vegetation, wetlands, wildlife and wildlife habitat, SAR, and socio-economic environment were assessed.

Interactions between key Project activities and the environment were rated according to the potential for an activity to interact with one or more Valued Components of the biophysical or human environment. Ratings were assigned as follows:

- 0 = No interaction;
- 1 = Interaction occurs; however, based on past experience and professional judgment the interaction would not result in a significant environmental effect, even without mitigation; or interaction would not be significant due to application of codified environmental protection practices that are known to effectively mitigate the predicted environmental effects; and
- 2 = Interaction could result in an environmental effect of concern even with mitigation; the potential environmental effects are considered further in the environmental assessment.

Table 5-1 provides a summary of criteria that were used in the determination of significance and residual effects on the biophysical and socioeconomic environment.

An overview of potential interactions between the Project and Valued Components is provided in **Table 5-2a and Table 5-2b**. A detailed description of the methods used to conduct this ESEIA is located in **Appendix A**.

Table 5-1 Criteria Used to Assess Residual Effects

Criteria	Value	Definition
Direction	Positive	The expected trend of the effect will not result in an adverse effect to the Valued Component
	Negative	The expected trend of the effect will result in an adverse effect to the Valued Component
Magnitude	Negligible or Low	The Project will have no measurable effect on landscape, community, or species distributions and diversity
	Moderate	The Project will alter landscape, community and species distributions, but will not alter diversity
	High	The Project will alter landscape, community, and species distributions and alter diversity

Table 5-1 Criteria Used to Assess Residual Effects

Criteria	Value	Definition
Geographic Extent	Site-specific	The extent of the effect is within the PDA
	Local	The extent of the effect is within the LAA
	Sub-Regional	The extent of the effect is within the RAA
	Regional	The extent of the effect extends beyond the RAA
Duration	Short Term	Less than one year
	Medium Term	More than one year but not beyond the life of the Project
	Long Term	Beyond the life of the Project
Frequency	Once	The effect occurs once during the Project on a specific Project phase
	Intermittent	The effect occurs intermittently during the Project on a specific Project phase
	Regular	The effect occurs on a regular basis during the Project on a specific Project phase
	Continuous	The effect occurs continually during the Project on a specific Project phase
Reversibility	Reversible	The Valued Component or measurable parameter is predicted to recover from an effect
	Irreversible	The Valued Component is predicted to not recover from an effect

The magnitude, extent and duration of residual Project effects were considered to determine significance. Significance reflects the potential for the Project to contribute to permanent changes and is divided into two categories;

- Not significant – the Project will have no effect, or a short to medium-term reversible effect on a Valued Component; and
- Significant – the Project will have an irreversible, or long-term but reversible effect on a Valued Component.

Although the Project consists of eight Project Sites, the impacts of the Project have been assessed as two groups of Project Sites based on the similarity of potential interactions at each Project Site. All Project Sites at existing Enbridge facilities (Sarnia Terminal, densitometer site at KP 2993.38, North Westover Station, Hilton Station, Cardinal Station, Terrebonne Station, and Montreal Terminal) have been assessed as one Project component. Construction activities will be similar at each of the existing facilities and will occur within previously disturbed, fenced-in, graveled areas. No new lands, access roads or off-site temporary work spaces will be required at any of these Project Sites. An overview of potential interactions between the Project and Valued Components for these Project Sites is provided in **Table 5-2a.**

The new densitometer site at KP 2989.30 has been assessed as a separate Project component since it will require ground disturbance beyond existing fenced-in facilities, and temporary work space will be required outside of the ROW. Existing access roads will be used to access the LAA. However; a small, permanent access road will be constructed as part of the Project between Settler's Road and the fenced-in site. An overview of potential interactions between the Project and Valued Components for this Project Site is provided in **Table 5-2b.**

Proposed mitigation measures for each Valued Component are outlined in **Table C-1** in **Appendix C**.

Table 5-2a Interaction of Project Activities at the Existing Project Sites with the Environment

Project Activities/ Physical Works	Project Description Reference for Activity	Air Quality & Greenhouse Gas Emissions	Acoustic Environment	Water Quality and Quantity	Fish and Fish Habitat	Soils and Soil Productivity	Vegetation	Wetlands	Wildlife and Wildlife Habitat	Species at Risk	Socio-Economic
Construction and Commissioning											
Activity 1	Surveying	1	1	0	0	0	0	0	1	1	1
Activity 2	Trenching	1	1	1	1	1	0	1	1	1	1
Activity 3	Mechanical and Electrical Equipment Installation or Removal	1	1	0	0	0	0	0	1	1	1
Activity 4	Backfilling	1	1	1	1	1	0	1	1	1	1
Activity 5	Hydrostatic Testing	1	1	1	1	0	0	1	1	1	1
Activity 6	Cleanup	1	1	1	1	1	0	0	1	1	1
Operations											
Activity 1	Maintenance Activities (including ground disturbance, as necessary)	1	1	1	1	0	0	0	1	1	1
Activity 2	Facility Operations	1	1	1	0	0	0	0	1	1	1
Accidents, Malfunctions and Unplanned Events											
Scenario #1	Hydrocarbon Leak	0	0	1	1	1	1	1	1	1	1

Notes:

0 = No interaction.

1 = Interaction occurs; however, based on past experience and professional judgment the interaction would not result in a significant environmental effect, even without mitigation; or interaction would not be significant due to application of codified environmental protection practices that are known to effectively mitigate the predicted environmental effects.

2 = Interaction could result in an environmental effect of concern even with mitigation; the potential environmental effects are considered further in the environmental assessment.

Table 5-2b Interaction of Project Activities at Project Site KP 2989.30 with the Environment

Project Activities/ Physical Works	Project Description Reference for Activity	Air Quality & Greenhouse Gas Emissions	Acoustic Environment	Water Quality and Quantity	Fish and Fish Habitat	Soils and Soil Productivity	Vegetation	Wetlands	Wildlife and Wildlife Habitat	Species at Risk	Socio-Economic
Construction and Commissioning											
Activity 1	Surveying	1	1	0	0	1	1	0	1	0	1
Activity 2	Topsoil Stripping and Trenching	1	1	1	0	2	2	1	1	0	1
Activity 3	Mechanical and Electrical Equipment Installation	1	1	0	0	0	0	0	1	0	1
Activity 4	Backfilling	1	1	1	0	1	1	0	1	0	1
Activity 5	Cleanup	1	1	1	0	1	1	0	1	0	1
Operations											
Activity 1	Maintenance Activities (including ground disturbance, as necessary)	1	1	1	0	0	0	0	1	0	1
Activity 2	Operations	1	1	1	0	0	0	0	1	0	1
Accidents, Malfunctions and Unplanned Events											
Scenario #1	Hydrocarbon Leak	0	0	1	1	1	1	1	1	1	1

Notes:

0 = No interaction.

1 = Interaction occurs; however, based on past experience and professional judgment the interaction would not result in a significant environmental effect, even without mitigation; or interaction would not be significant due to application of codified environmental protection practices that are known to effectively mitigate the predicted environmental effects.

2 = Interaction could result in an environmental effect of concern even with mitigation; the potential environmental effects are considered further in the environmental assessment.

5.1 Air Quality and Greenhouse Gas Emissions

Project activities during construction, commissioning and operations at all Project Sites may result in emissions of criteria air contaminants including GHGs and fugitive dust to the atmosphere. These emissions have the potential to cause adverse environmental effects on the atmospheric environment, via a change in air quality or a change in GHG emissions. The potential interactions between the Project and the atmospheric environment are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.1.1 Construction

GHG emissions to the atmosphere may occur during construction and commissioning activities such as the installation of mechanical and electrical equipment, grubbing, grading, trenching and clean-up. GHG emissions from fuel combustion and fugitive dust from vehicles and the disturbance and movement of soil and gravel are expected to contribute most substantively to emissions during this phase.

Air contaminant and GHG emissions including NO_X, CO, PM, and CO_2 as a result of fuel combustion during construction activities at each Project Site are expected to be localized in extent, short-term in duration, and small in magnitude (i.e., similar to local emissions from local roadways). Construction equipment will be required to have proper mufflers installed and operating properly to reduce further emissions into the atmosphere. Therefore, such emissions are not expected to cause changes in the local air quality due to the Project, and will emit a fractionally small amount of GHG in the form of CO_2.

The densitometer site at KP 2989.30 will be located within an active agricultural field, adjacent to an existing Line 7 valve site, and a highway is located within the LAA of the Project Site. As such, GHG emissions from fuel combustion during construction will be of low magnitude relative to background air quality levels currently experienced in the LAA due to volume of traffic and machinery used for existing agricultural practices. In addition, existing agricultural practices in the vicinity of the densitometer site at KP 2989.30 currently move soils and contribute to fugitive dust emissions. Additional emissions during the construction of the Project are not expected to result in a significant increase to existing dust levels.

The U.S. Environmental Protection Agency (1995) estimates fugitive dust emissions from construction activities based on the size of the construction area. Using these factors and assuming a one acre (0.45 ha) area of disturbance, the PM emissions due to fugitive dust during construction at each Project Site (without mitigation) are expected to be on the order of 40 kg/day. With the appropriate mitigation, these emissions could be reduced between 50 and 90%, which means that PM emissions during construction are expected to be no greater than 20 kg/day. These emissions are small compared to larger construction operations such as building a residential complex or a highway. In addition, the assumption that one acre of land will be disturbed is conservative given the planned construction activities at each Project Site. As such, the potential Project effects as a result of fugitive dust emissions will be minimized through the use of standard equipment operating practices that are known to effectively mitigate

potential effects on the receiving environment, such as spraying exposed soils with water or tackifiers (if required) during excessively dry conditions.

Construction-related air quality effects are expected to be negative but low in magnitude relative to background levels, localized in extent, short term, occurring for the duration of the construction phase of the Project only, and are reversible. It is anticipated that once construction is completed, all emissions will revert to background levels and no substantive changes in air quality are expected due to emissions from construction activities. Therefore, no significant adverse residual effects on the atmospheric environment are predicted during construction.

5.1.2 Operations

The anticipated Project-related changes in air contaminant and GHG emissions during Project operations are due to changes in electricity consumption, and products stored in tanks at Project Sites, where applicable. Overall, the changes in air contaminant and GHG emissions due to the Project during Operations are expected to be small compared to the existing emissions from the facilities.

Changes in products stored at the Project Sites are not expected to result in substantive changes in air contaminant emissions. The majority of GHG releases during Project operations would be indirectly emitted due to electricity consumption by the pumps at each of the Project Sites. As the Project-related changes in total pump horsepower and associated changes in indirect GHG emissions are expected to be less than 1%, the Project is not expected to contribute substantively to a change in GHG emissions on a provincial or national scale. In addition, no increase in the frequency of maintenance activities at these Project Sites is anticipated due to the implementation of the Project. Consequently the Project is not predicted to result in a significant increase in air contaminant or GHG emissions during its operational phase at any of the existing Project Sites.

Emissions of GHGs and PM at the densitometer site at KP 2993.38 are currently negligible due to the nature of the equipment. The removal of the densitometer and obsolete equipment at KP 2993.38 will result in no change to existing air quality and GHG emissions at this Project Site.

Air quality, GHG and PM emissions during the operational phase of the Project at the densitometer site at KP 2989.30 will be limited to those from maintenance activities. While these activities may result in a negative environmental effect, the effect is expected to be of low magnitude, localized, occurring intermittently for a short duration (i.e. during the period of maintenance works) and reversible. Agricultural activities within the LAA will be ongoing after the commissioning of the Project, and therefore Project-related emissions are anticipated to be small relative to background emissions and their effect is predicted to be not significant.

Therefore, no significant adverse environmental effects on the Atmospheric Environment are anticipated during Project operations.

5.2 Acoustic Environment

Construction and maintenance equipment will generate short-term increases in noise levels for nearby receptors within the LAAs. Noise emissions have the potential to cause adverse environmental effects on the acoustic environment through increases in background noise levels in each LAA during the operational life of the Project. The following impact assessment is based on the Environment Noise Assessment (2012) completed by Novus for the Project. The Novus report (Novus Environmental Inc. 2012) and data are provided in **Appendix D**. The potential interactions between the Project and the acoustic environment are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.2.1 Construction

Construction and commissioning activities will include: trenching, structural, electrical and mechanical works, and clean-up at each of the Project Sites. The equipment used during construction is expected to have associated noise emissions and may result in localized, short term and reversible (approximately seven month construction schedule) increases in noise levels at noise receptors in close proximity to the Project Sites during the day and evening periods.

The typical hours of construction will be from 7:00 am to 7:30 pm and will be adjusted, if necessary, to meet applicable by-law requirements of the municipalities in which the Project Sites are located. In the unlikely event that construction activities are required outside of these hours, permits/exemptions will be obtained directly from the municipal jurisdiction in advance.

All equipment will be properly maintained to limit noise emissions. As such, all construction equipment will be operated with effective muffling devices that are in good working order. Should noise complaints be received, verification that the general noise control measures agreed to are in effect will be completed. In the presence of persistent noise complaints, all construction equipment would be verified to ensure compliance with applicable MOE NPC-115 guidelines (MOE 1977c).

Noise sensitive receptors (i.e. farms or residences) are located within the LAAs of all Project Sites. Due to the generally urban acoustic environment and large separation distances (greater than 250 m) between noise sensitive receptors within the LAAs for the Sarnia Terminal, densitometer site at KP 2993.38, Terrebonne Station, and Montreal Terminal and these Project Sites, the potential for negative effects is not anticipated during the construction period at these Project Sites.

There is the potential for negative effects at nearby residential receptors surrounding the proposed densitometer site at KP 2989.30, North Westover Station, Hilton Station and Cardinal Station during construction activities, due to the close proximity of receptors and/or the relatively low sound level acoustic environment. At these Project Sites, construction related noise is expected to have a potentially negative effect, but the effect will be of low magnitude, localized in extent and short term in duration (approximately seven month construction schedule). As such, residual effects on the acoustic environment due to construction of the Project are not

anticipated. Stakeholders will be informed through update letters as the Project progresses through construction and in-service.

5.2.2 Operations

Changes in noise emissions during Project operations may result from changes in equipment quantity, size, type, and installation condition (i.e., location, orientation, etc.) that are required to meet the operational needs of the Project. Equipment of concern in terms of potentially significant increases in noise emissions include the addition of new mainline and booster pumps, and ventilation equipment (i.e. air ventilation fans and exhaust fans), as well as intermittent equipment testing as required. Additional equipment as described in Table 2-2, will be located either outdoors or within building extensions depending on the Project Site.

Based on site measurements and observations made, equipment modifications and additions at the Quebec Project Sites as a result of the Project are not considered to be noise sources of interest for the surrounding receptors. Therefore, noise impacts from the Terrebonne Station and Montreal Terminal are not anticipated to change as a result of the Project. Predicted sound levels from the facilities are presented in **Appendix D**.

New noise sources (i.e. pumps and ventilation fans) are anticipated at the Sarnia Terminal and North Westover Station. However, based on source specific noise measurements, modelled noise impacts and observations made, operational noise impacts with the inclusion of the proposed modifications are expected to meet the applicable guideline limits (**Table 4-4**) for these Project Sites (**Appendix D**). As a result, no adverse noise impacts are anticipated as a result of the Project at these Project Sites.

Equipment from the existing densitometer site at KP 2993.38 will be relocated to KP 2989.30 as part of the Project. The noise source of interest at the existing densitometer building is a tonal sidewall exhaust vent, which primarily includes noise from a pump located within the building. Based on site measurements and observations made, the existing densitometer building noise is anticipated to be inaudible at the closest noise sensitive receptor. This is due to the large separation distances (> 350 m), intervening foliage, and relatively low sound levels. Removal of the existing densitometer equipment is not anticipated to affect the noise impacts at the closest noise sensitive receptors, due to the inaudibility of the existing equipment.

Based on an assessment of noise at KP 2993.38, the noise source of interest for the proposed relocation of densitometer equipment to KP 2989.30 is from a pump located within densitometer housing. The pump noise is anticipated to be audible through a sidewall vent, located on the north side of the building. This source is considered tonal, and has been assessed including a 5 dBA tonal penalty. Predicted sound levels from the relocated densitometer building at KP 2989.30 are 41 dBA. Based on **Table 4-4**, these sound levels would meet the applicable guidelines. As a result, no adverse noise impacts are anticipated as a result of the Project at the densitometer site at KP 2989.30.

The noise level exceedances at Hilton and Cardinal Stations are due to current operating conditions, and specifically due to the Rooftop Exhaust Fans, at each station. Current operating

conditions are unrelated to the Project. Noise mitigation in the form of exhaust silencers (mufflers) is required for the Rooftop Exhaust Fans at Hilton Station and Cardinal Station. A minimum 5 dB attenuation is required at Hilton and 7 dB at Cardinal for these noise sources. Based on consultation with Enbridge, mitigation of the Rooftop Exhaust Fans will be completed prior to Project commencement. With appropriate mitigation in place in the form of exhaust silencers, the applicable guideline limits would be met (**Table 4-4**).

New noise sources to be installed at the Hilton Station and Cardinal Station for the Project include a mainline pump and air ventilation fan at both Project Sites. With existing conditions mitigated prior to Project commencement, source specific noise measurements, modelled noise impacts and observations made indicate that operational noise impacts with the inclusion of the proposed modifications are expected to meet the applicable guideline limits (**Table 4-4**) for these Project Sites. Consequently, residual sound levels would meet the applicable noise guidelines at these Project Sites, and no adverse noise impacts would be anticipated as a result of the Project.

Negative impacts on the acoustic environment could result from a short-term increase in noise emissions associated with regular maintenance and required repairs at each of the Project Sites during Project operations. However, no increase in the frequency of maintenance activities is expected for any of the existing facilities as a result of the Project. Noise emissions during maintenance activities will be short term in duration, low in magnitude and reversible. Noise emissions due to maintenance activities should be similar in nature but smaller than those during construction since no specialized equipment will be required for constructions activities (i.e. earth moving, installation of fencing etc.). At the densitometer site at KP 2989.30, maintenance activities that have not previously been required in this location will be necessary due to the Project. Similarly to the existing facilities, noise emissions due to maintenance activities at this Project Site will be short term in duration, low in magnitude and reversible, and therefore no significant noise impacts are predicted.

With assumed mitigation measures in place, where required, residual effects on the acoustic environment as a result of Project operations at the existing facilities are expected to be negligible compared to existing background noise emissions, and will meet MOE and MDDEP guidelines, where applicable. Overall noise impacts from Project operations will therefore be long-term in duration, but negligible in magnitude, localized in extent and predicted to be not significant.

5.3 Water Quality and Quantity

No water supply wells are located within the PDAs of any Project Site. There are a total of 83 recorded groundwater wells within the LAAs of the Project Sites. In-water works are not required for this Project, and the majority of Project activities will be located above ground, thus minimizing ground disturbance activities. Impacts to water quality are anticipated to be minimal and limited to potential silt and sediment runoff from the construction sites.

Impacts to water quantity may result from short-term pumping of water from trenching (as required for employee safety) during construction and maintenance activities. Water pumped as

a result of trenching activities will be managed within the existing facilities or discharged to the ROW where applicable (i.e. densitometer site at KP 2989.30). In addition, where new pipe connections require hydrostatic testing on-site after installation, impacts to water quality and quantity are assessed in subsection 5.3.1. Potential interactions between the Project and water quality and quantity are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.3.1 Construction

Construction activities could potentially impact water quality through the discharge of silt and sediment and other deleterious substances to a nearby waterbody. However, the release of a deleterious substance, silt and/or sediment is unlikely at the majority of the Project Sites due to the location of construction activities within fenced-in areas and no requirement for in-water works at any Project Site.

The only Project Site with a waterbody located within the PDA is the Sarnia Terminal. If works are required within 30 m of the watercourse (Cole Drain) located along the eastern edge of the PDA boundary, appropriate diffusion mitigation measures such as the installation of siltation fencing, will reduce the likelihood of any discharge of silt or sediment to the watercourse.

Where work does not take place within a fenced-in area at the densitometer site at KP 2989.30, the release of a deleterious substance, silt or sediment is still predicted to be unlikely since no in-water works are required. In addition, no waterbodies are located within 100 m of the PDA and mitigation measures are known to effectively mitigate a release of a deleterious substance without the requirement for additional fencing around the construction area. Spill kits will be in place to minimize the potential impacts should the discharge of a deleterious substance occur at any Project Site. Should the release of silt or sediment occur, it is anticipated that the impact would be short-term and reversible with the implementation of mitigation measures such as siltation fencing and filter bags.

Water quantity may be affected by construction dewatering of trenches (if required). Impacts to water quantity are considered to be minor as dewatering will be limited to short-term events during construction to ensure the safety of workers in the excavation, and the Project scope does not indicate the requirement for any excavations that may result in the dewatering in large volumes (i.e. > 50,000 L/day) **(Table 2-2**). If required, dewatering will occur intermittently during construction activities. Furthermore, water will be pumped out of excavations and managed on-site in the case of the station and terminal Project Sites or it will be allowed to infiltrate into the ground near the work site on the ROW where applicable (i.e. at the densitometer site at KP 2989.30).

Where new piping infrastructure is installed, pressure testing will be required prior to commissioning of the Project. Based on the Project scope (**Table 2-2**), pressure testing will be required at Sarnia Terminal, North Westover, Hilton, Cardinal and Terrebonne Stations and Montreal Terminal. To reduce potential adverse effects from the withdrawal of test water for the purpose of hydrostatic testing on water quantity, it is anticipated that test water will be trucked on-site from municipal and other private sources. All hydrostatic testing activities will be

conducted in accordance with the NEB *Onshore Pipeline Regulations, 1999*, provincial regulations, as well as the latest version of Canadian Standards Association ("CSA") Z662-11. The Enbridge Environment Project Lead will be responsible for notifying the appropriate municipalities prior to water withdrawals, and municipal water sources will be treated to remove chlorine, as necessary, prior to use.

Prior to the discharge of hydrostatic test water, all applicable testing and treatment measures will be implemented in accordance with the above noted regulatory requirements and disposed on-site using existing stormwater management facilities or trucked off-site to licensed liquid waste treatment facilities as necessary. Detailed mitigation measures associated with hydrostatic testing for the Project are provided in **Table C-1**. Since all water for the purpose of pressure testing will be drawn from municipal and private sources and will be managed using onsite stormwater management facilities or trucked offsite as required, the potential impacts to the quality and quantity of surface water and/or groundwater resources and their downstream receivers, are expected to be negligible and not likely to result in a significant adverse residual environmental effect.

Project activities are not expected to result in interactions with waterbodies within the LAAs of any Project Site. However, where Project construction may result in a negative environmental effect on water quality and/or quantity (i.e., due to the release of a deleterious substance, silt or sediment; trench dewatering, and/or pressure testing), the implementation of mitigation measures outlined in **Table C-1**, are known to effectively mitigate the potential for a significant adverse residual effect. As a result, the effects of the Project on water quality and quantity are predicted to be short-term in duration, reversible and not significant.

5.3.2 Operation

Impacts to water quality and quantity during operations will be limited to maintenance activities that will consist of similar activities as the construction phase of the Project although smaller in scope. As a result, impacts as a result of Project operations are considered to be similar to those anticipated during construction, and the mitigation measures implemented will be the same as those noted in subsection 5.3.1.

Impacts to water quality during Project operations are predicted to be negligible since no in-water works are required. The Sarnia Terminal is the only Project Site with a waterbody located within the Project Site PDA. Should Project maintenance activities take place within the vicinity of the Cole Drain located on the western, northeastern and southern boundaries of the Sarnia Terminal PDA, appropriate mitigation measures including the use of siltation fencing, are known to effectively mitigate the potential for the release of silt, sediment or deleterious substances. As such, with the implementation of planned mitigation measures, no significant residual effects on water quality are anticipated.

As indicated in subsection 5.3.1, impacts to water quantity are considered to be minor as dewatering will be limited to short-term events during construction and maintenance activities. If required, dewatering will occur intermittently during maintenance activities and water will be pumped out of the trench and managed within the Project Site or allowed to infiltrate into the

ground near the work site on the ROW. With the implementation of planned mitigation measures, significant adverse environmental effects on water quantity during operations are predicted to be not significant.

5.4 Fish and Fish Habitat

There are no watercourse crossings and in-water works are not required for the Project. Impacts to fish and fish habitat will be limited to impacts resulting from the potential transfer of deleterious substances such as silt and sediment from construction sites and during regular maintenance activities requiring excavation and the withdrawal and discharge of test water for the purpose of pressure testing. The potential interactions between the Project and fish or fish habitat are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.4.1 Construction

The main types of deleterious substances that could be released during construction are sediment and hydrocarbons from equipment. Sediment can be introduced into watercourses when construction activities take place within or near a watercourse. As such, impacts to fish and fish habitat as a result of the Project are unlikely since no-in-water works are required and no waterbodies are located within the PDAs of any Project Sites, with the exception of the Sarnia Terminal.

Cole Drain is located along the western, northeast and southern boundaries of the Sarnia Terminal PDA. Based on a review of baseline conditions outlined in subsection 4.1.6.1. Cole Drain flows along the northeast boundary of the PDA and flows to the northwest where it eventually discharges into Talfourd Creek and the St. Clair River. According to the St. Clair River Watershed Plan (SCRCA, 2009), the Cole Drain is classified as a Class C Drain that supports a warmwater fish community without top predators. No-in-water works will be required within Cole Drain and as such, the potential for interactions between construction activities and Cole Drain are limited. However, should construction activities take place within 30 m of the Drain; standard diffusion mitigation measures as outlined in **Table C-1** and subsection 5.3.1. will be implemented.

Where new piping infrastructure is installed, pressure testing will be required prior to commissioning of the Project. As indicated in subsection 5.3.1, pressure testing will be required at Sarnia Terminal, North Westover, Hilton, Cardinal and Terrebonne Stations, and Montreal Terminal. Where the withdrawal and discharge of water is required for pressure testing, there is the potential to adversely affect water resources and their downstream users, including fish species and aquatic habitat. However, as outlined in subsection 5.3.1, the effects of the Project on water resources in the LAAs as a result of hydrostatic testing is expected to be negligible since test water will be required at each Project Site in small volumes (a maximum of 100,000 L is anticipated per Project Site), will be sourced from municipal and private sources only, and will not be sourced from, or discharged into, natural waterbodies within the LAAs.

While there is no fish habitat located within the PDAs of the majority of the Project Sites, there remains the potential for deleterious substances to run off from the construction sites and

eventually flow into downstream receiving waterbodies that provide habitat for fish within the Project Site LAAs. However, it is expected that recommended mitigation measures outlined in **Table C-1** will be implemented and as a result, Project activities are not expected to result in interactions with waterbodies within the LAAs. Consequently, significant residual effects on fish or fish habitat are expected to be negligible.

5.4.2 Operations

Impacts to fish and fish habitat during operations will be limited to maintenance activities that will consist of similar activities as the construction phase of the Project. As a result, impacts and mitigation measures are considered to be similar for operations and are not expected to result in significant residual environmental effects.

Impacts to water quality during construction and operations of the Project are predicted to be negligible (subsections 5.3.1 and 5.3.2) since no in-water works will be required as part of the Project and no removal of riparian vegetation will be required at any Project Site. The Sarnia Terminal is the only Project Site where a waterbody, and thus fish habitat, is located within the PDA. Should Project operational or construction activities take place within the vicinity of Cole Drain located along the outer eastern boundary of the Sarnia Terminal PDA, appropriate mitigation measures will be implemented to mitigate the potential for adverse effects as indicated in subsection 5.4.1 and **Table C-1**. As such, negative effects are predicted to be effectively mitigable and residual effects on fish and fish habitat as a result of the Project were predicted to be not significant.

5.5 Soils and Soil Productivity

Construction and operations could impact soils and soil productivity at all Project Sites should a hazardous material spill occur or an area of historical contamination be identified (i.e., contamination issues); therefore, the impact of spills has been included in this section.

Impacts to soils and soil productivity during construction will also occur at the densitometer site at KP 2989.30 where works will take place along the ROW and an adjacent TWS within an active agricultural field. The potential interactions between the Project and soils and soil productivity are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.5.1 Construction

At the densitometer site at KP 2989.30, construction will require the permanent conversion of a small area of productive soils within the ROW currently used for corn production, to a graveled area of approximately 0.05 ha for both the densitometer building and permanent access to the Project Site. The area of conversion will be contained within the Enbridge ROW and will incorporate the existing valve site currently located within the Project Site PDA. The temporary loss of productive soils will also be required for a TWS which will be aligned along the outer boundary of the ROW at KP 2989.30. The remainder of the agricultural field will remain active during the construction and operation of the Project. As indicated above, the area that will be permanently lost as a result of this Project is 0.05 ha compared to the remaining field, which is

approximately 25 ha. This area of permanent loss of land area capable of agricultural production only represents 0.2% of the existing agricultural field at this location. Impacts to soils and soil productivity, as a result of the permanent removal of productive soil, are expected to be negative in direction; irreversible for the duration of the Project; low in magnitude; and site-specific in extent. Further assessment of the significant residual effect of the Project on soils and soil productivity is provided in subsection 5.5.3.

In the event that historical soil contamination is discovered at the Project Sites during construction excavations, or should a hydrocarbon spill occur during construction, management of contaminated soils would follow the standard procedures outlined in the EGC (2012). Soils will be considered contaminated if hydrocarbon odours or discolourations are present. As per the detailed prevention and mitigation measures provided in **Table C-1**, soils suspected of being contaminated will be segregated from productive soils and stored separately, at least 100 m from any waterbody. Should the storage of contaminated soils be required, it will occur in an area of flat topography and the stockpiles will be surrounded by siltation fencing. Soils suspected of contamination will be stored on an impermeable liner within a bermed area on the ROW or within the fenced-in area.

Composite soil samples of stockpiles suspected of contamination will be collected and analyzed. Where soils meet applicable regulatory criteria, they will be backfilled. If required, new soil would be imported from an appropriate site should it be required to maintain the existing site conditions. Should new soil be imported, it would be from a licensed aggregate supplier who would be responsible for ensuring the soil is clean, free from potential contamination, uniform and suitable for compaction. Where potentially contaminated soil is removed for temporary or emergency situations, or where immediate backfill is required during construction or for inspection purposes, soils that meet the applicable regulatory criteria may be returned to the area of the excavation where it has been determined that there is no safety, compaction risk or potential for off-site impacts from the implementation of proper environmental management measures.

Should issues of soil contamination arise, contaminated soil will be disposed of at a licensed treatment or disposal facility and appropriate mitigation measures will be put in place as described in **Table C-1**. New soil will be imported from an appropriate site should it be required to maintain the existing site conditions.

Although impacts to soil and soil productivity as a result of a spill or historical contamination would be moderate in magnitude, they would be short-term, localized in extent, and reversible with mitigation measures in place. Consequently, soil contamination as a result of construction of the Project is mitigable and not anticipated to result in a significant residual effect to soils and soil productivity.

5.5.2 Operations

Once the Project is commissioned and in operation, additional lands will not be required, and maintenance activities will take place within the converted area and ROW similar to the Project Sites at the existing facilities. Therefore, impacts to soils and soil productivity during the

operational phase of the Project will be limited to potential contamination issues (i.e. a hydrocarbon spill or discovery of contaminated soil during maintenance activities).

The management of contaminated soils during operations would follow the same procedures as those outlined for the construction phase of the Project in subsection 5.5.1. Although impacts to soil and soil productivity as a result of a spill or historical contamination may be moderate in magnitude, they would be short-term, localized in extent, and with mitigation measures in place and are therefore not predicted to result in a significant negative residual effect on soils or soil productivity.

5.5.3 Residual Effects Assessment

Construction and operation activities during the life of the Project have the potential to interact with agricultural land use through the permanent loss of soils and soil productivity at the densitometer site at KP 2989.30. Site construction will remove a small area of cultivated land within an active corn field. Soils will be converted to a graveled area and permanent access route within the ROW, for the duration of the Project and this small area of land will no longer provide productive soils for agricultural use. However, 24.82 ha (more than 99%) of the field area will remain unchanged during construction and operations of the Project. Permanent loss of soils and soil productivity will be contained within the ROW and will be an extension of a pre-existing area where soil has been previously converted to a graveled area for the installation of a valve site. As such, residual effects of the Project on soils and soil productivity are expected to be significant and negative in direction, but of negligible magnitude, and site-specific in extent.

5.5.4 Cumulative Environmental Effects

There will be a minor residual effect as a result of a reduction in productive soils at one Project Site. As a result of ROW preparation and construction, there will be a disturbance to the landscape which may result in changes to surface contours and risks associated with erosion and sedimentation. The permanent loss of soil productivity will be limited to one isolated area that will be small in size and confined to the ROW at KP 2989.30. Consultation with the City of Hamilton municipal planning department has indicated that no other projects are currently planned within the vicinity of the LAA. In addition, agricultural practices within the LAA are anticipated to remain unchanged. With mitigation, any potential effects to the physical environment, including soil productivity and agricultural land use should be minimal and the magnitude of cumulative environmental effects is considered negligible.

5.6 Vegetation

Vegetation clearing will be required only at the densitometer site at KP 2989.30. No clearing activities will occur at any other Project Sites during construction since Project works will be located within existing pre-disturbed areas that have been fenced-in. The potential interactions between the Project and vegetation are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.6.1 Construction

Based on an investigation of vegetation communities at the densitometer site at KP 2989.30, vegetation clearance will consist of the removal of cultivated crop. Permanent clearing will occur within the existing ROW, over an area of approximately 0.05 ha. Temporary vegetation clearing may occur within the area designated as TWS. The removal of vegetation at this Project Site will result in no change in local vegetation diversity and no loss of rare ecological communities or rare plants. Vegetation removal at the Project Site will be site specific in extent and occur once, resulting in a negative and irreversible environmental effect that will be low in magnitude. Construction at the remainder of the Project Sites will occur within graveled, fenced areas and will not require vegetation removal during the construction phase of the Project. In addition, the introduction of non-native or invasive plant species or weeds will be controlled at the Project Sites during construction by ensuring that all equipment (i.e. vehicles, materials) arrives at the Project Sites in a clean condition to reduce the risk of weed or invasive species introduction. Therefore, the Project is not expected to result in a negative environmental effect at these Project Sites. Further assessment of the residual effect of the Project on vegetation is provided in subsection 5.6.3.

5.6.2 Operations

Vegetation removal at the densitometer site at KP 2989.30 will occur once and will take place during the construction phase of the Project and will be irreversible. Once the Project has been commissioned, the TWS will be reclaimed and Project works (i.e. operations and maintenance activities) will take place within the existing fenced-in, graveled areas at all Project Sites.

Vegetation removal is completed by Enbridge during regular maintenance activities within the fenced-in facilities and will occur during the operational phase of the Project at each of the Project Sites. Vegetation removal during maintenance activities will be implemented as guided by the post-construction vegetation and weed management plan detailed in the Enbridge LP Vegetation Management Guide. As indicated in subsection 5.6.1, the introduction of non-native or invasive plant species or weeds will be controlled at the Project Sites during operations and maintenance activities by ensuring that all equipment (i.e. vehicles, materials) arrives at the Project Sites in a clean condition. Consequently, impacts to vegetation during the operational phase of the Project will be short-term to medium term in duration, low in magnitude and site specific in extent and are predicted to be non-significant.

5.6.3 Residual Effects Assessment

Since the densitometer site at KP 2989.30 is located within an area that has been previously disturbed by agricultural activities, local vegetation diversity will not be impacted by vegetation removal required for the Project. Residual Project effects on vegetation will be negative in direction at the densitometer at KP 2989.30. At this Project Site, the residual effect will be irreversible and therefore significant. However, the effect will be site-specific in extent, negligible in magnitude and occurring once.

5.6.4 Cumulative Environmental Effects

There will be a minor residual effect as a result of a reduction in vegetation at one Project Site. However, this reduction will be an extension of existing disturbances as a result of agricultural and industrial activities within the PDA at KP 2989.30. Vegetation removal at the Project Site in combination with existing agricultural activities will not result in new fragmentation of habitat, reduced local vegetation diversity or loss of rare plant species. In addition, consultation with the City of Hamilton municipal planning department has indicated that no other projects are currently planned within the vicinity of the LAA. As a result, the magnitude of cumulative environmental effects is considered negligible.

5.7 Wetlands

The Sarnia Terminal, Hilton Station, Cardinal Station, Terrebonne Station and Montreal Terminal are not located within 500 m of any wetlands. However, the Sheffield-Rockton Wetland PSW Complex is located within the LAA of the densitometer sites at KP 2989.30 and KP 2993.38 and North Westover Station. The potential interactions between the Project and Wetlands are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.7.1 Construction

Construction activities that may impact wetlands are limited to activities occurring at the densitometer sites at KP 2989.30 and KP 2993.38 and North Westover Station. These Project Sites have a PSW (Sheffield-Rockton Wetland Complex) located within their LAAs.

The densitometer sites at KP 2989.30 and KP 2993.38 and the North Westover Station are bordered by the Sheffield-Rockton PSW Complex. Small pockets of unevaluated wetland are also located between 50 m and 300 m south of the PDA at the densitometer site at KP 2993.38. As indicated in subsection 4.1.4.1, portions of the PSW Complex are located approximately 400 m northwest of the densitometer PDA at KP 2989.30, approximately 400 m west and 400 m northeast of the densitometer PDA at KP 2993.38, and approximately 260 m northwest and 180 m northeast of the North Westover Station PDA.

Construction at the North Westover Station and densitometer site at KP 2993.38 will occur within a fenced-in, graveled area and access to both Project Sites will utilize existing access roads. At the densitometer site at KP 2989.30, all construction activities will be limited to the Enbridge ROW and a TWS located in the surrounding agricultural field. All works will take place outside of the wetland boundaries and no in-water works are required as part of the Project. As a result, removal of wetland vegetation will not be required at any of the Project Sites, and no wetland clearing will occur. Potential impacts to the Sheffield Rockton Complex PSW will be limited to the potential for silt and sediment runoff and/or dust and vehicle emissions created during construction which are known to be effectively mitigated through the use of siltation fencing, filter bags and dust suppressants if necessary. In addition, no watercourses that flow through wetlands in the LAAs cross through any of the Project Site PDAs. As such, no off-site impacts are anticipated at the Project Sites and with the implementation of the standard mitigation measures (**Table C-1**), Project activities during construction are not anticipated to

result in a residual effect on wetlands in the LAAs as a result of silt or sediment runoff from construction areas or the emission of fugitive dust.

Since the above referenced Project Sites are located within close proximity to wetlands, it is anticipated that groundwater may enter trench work during construction, and pumping the groundwater out of the trenches may be required to maintain a safe working environment. Silt fencing will be installed around trenches to control potential levels of sedimentation that might originate in the construction area and this will also reduce the potential for the movement of sediment from the construction sites to wetland in the LAAs. Groundwater pumped from excavated areas will be pumped through an erosion and sediment control device into an area of undisturbed vegetation beyond the boundaries of the adjacent wetland to allow the water to infiltrate the surrounding soil. Where feasible, in order to avoid the migration of silt to the wetland and maintain the natural flow of water through the wetland and receiving tributaries, dewatering discharge will be managed on-site where stormwater management areas are already in place. At the densitometer sites (i.e., at KP 2989.30 and KP 2993.38) water will be discharged to the surrounding environment through geotextile filter bags as needed. Dewatering will occur on an as-needed basis to ensure worker safety during activities such as welding that require dry conditions.

As a result, impacts to the hydrology of the surrounding wetland are not expected to result in a residual effect during construction activities. Impacts will be limited in duration since they will occur for short time periods during construction activities and are not predicted to result in a significant residual effect on the Sheffield-Rockton Wetland Complex.

5.7.2 Operations

Impacts to wetlands during the operations phase of the Project will be limited to maintenance activities that may require excavation, and the potential for storm water run-off from the fenced-in, graveled areas to wetlands within the LAAs (densitometer sites at KP 2989.30 and KP 2993.38, and North Westover Station). Operational activities will take place within the fenced-in, graveled areas that will be disturbed during the construction phase of the Projects. Existing access roads will be utilized during all maintenance activities. Therefore, maintenance activities will not require any additional lands or vegetation clearing within wetlands. Impacts to wetlands as a result of maintenance activities will be of similar nature to those outlined during the construction phase of the Project and are predicted to be short-term, mitigable, reversible and site-specific in extent. Therefore, the operational phase of the Project is not anticipated to result in a significant residual effect to wetlands.

5.8 Wildlife and Wildlife Habitat

The primary focus of the wildlife and wildlife habitat component of the ESEIA is with regards to wildlife species of conservation concern and their habitats. Since no significant wildlife habitat was identified within any of the Project Site PDAs during background research, the Project is not anticipated to result in an adverse effect to significant wildlife habitat. The removal of vegetation at the densitometer site at KP 2989.30 is not expected to significantly alter wildlife habitat since vegetation within the proposed PDA is limited to corn crop (section 4.1.1.4) and is not

considered to provide any significant wildlife habitat that is not available in the immediate vicinity of the Project Site.

As indicated in section 5.2.2, no long-term increase in the baseline sound emissions are predicted as a result of Project operations. As such, impacts to wildlife will be limited to sensory disturbances and potential wildlife collisions or entrapment during the construction phase and short-term disturbances during the operational phase of the Project as a result of maintenance activities only. The potential interactions between the Project and Wildlife and Wildlife habitat are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.8.1 Construction

The alteration of potential wildlife habitat alteration may occur at the densitometer site at KP 2989.30 as a result of vegetation removal. However, as discussed in subsection 4.1.1.4, vegetation at that Project Site consists of corn crop and is not considered to provide any significant wildlife habitat that is not available in the immediate vicinity of the Project Site.

The construction phase of the Project has the potential to impact wildlife through sensory disturbance and wildlife mortality. The following sections describe the potential impacts of these phases.

5.8.1.1 Sensory Disturbance

A certain level of sensory disturbance to wildlife in the LAA of each of the Project Sites has already resulted from ongoing agricultural, commercial, industrial and urban activities and other associated human activities. Sensory disturbances will occur from the visual disturbance of construction activities and the noise disturbance from operating machinery during construction. Visual disturbance will occur during the daylight hours and will be limited to the LAA for each Project Site. Disturbances related to construction noise will be moderate in magnitude, localized in extent, short term and reversible for each Project Site.

Construction noise levels are not anticipated to be a significant change from ambient sound levels due to agricultural activities and traffic already occurring in the LAAs (subsection 5.2.1). Furthermore, many wildlife species that are known to occur in the LAA of each site are mobile and are anticipated to avoid the Project Sites during construction. Mitigation measures as outlined in the EGC (2012) such as maintaining equipment in proper working order and ensuring that mufflers are functioning as intended will further minimize sensory disturbances to adjacent wildlife during construction. Mitigation measures will ensure that sensory disturbances are localized and as a result, no significant adverse residual effect on wildlife is predicted as a result of Project construction and associated sensory disturbance.

5.8.1.2 Wildlife Mortality

Mortality of wildlife is unlikely but has the potential to occur during construction of the Project. The majority of work will take place within fenced-in areas whereby wildlife access to the work areas will be limited. Where work does not take place within the existing fenced-in facilities, work areas will be fenced off as per the EGC (2012). There is a small chance of wildlife mortality as a result of the use of heavy equipment for moving materials on and off the Project

Sites. As described in the EGC (2012), collisions with wildlife as a result of this Project will be reported to the Ontario MNR, Quebec MDDEP, or the local police departments. Traffic in and out of each of the sites will be localized and of limited duration (approximately seven months) and as a result, impacts to wildlife due to collisions are not predicted to result in a significant adverse effect on wildlife in the LAA of the Project Sites.

5.8.2 Operations

Impacts to wildlife will result from sensory disturbance related to noise emissions during operations and minor increases to noise should maintenance be required. Minor increases to noise levels during maintenance activities will have similar impacts as construction impacts in that the machinery will result in minor increases to noise levels for short periods of time (three to four weeks). These increases will remain within federal and provincial guidelines that are set based upon impacts to the human environment (MOE, 1995a; 1995b) and will be short term in duration, moderate in magnitude and reversible.

Since no residual increase in noise levels is predicted due to the operational phase of the Project, it is also anticipated that wildlife occurring within the LAAs will be acclimated to the existing noise levels at the Project Sites. As such, the Project is not predicted to result in a significant adverse residual effect on wildlife as a result of sensory disturbances during operations. As indicated in subsection 5.8.1.2, should maintenance activities be required, traffic in and out of each of the Project Sites will be localized and of limited duration and impacts to wildlife due to collisions are not predicted to result in a significant adverse effect on wildlife during the operation of the Project.

5.9 Species at Risk

Construction will occur within fenced-in, graveled areas at Stations, Terminals and the densitometer site at KP 2993.38. These areas have been previously disturbed and are no longer considered to provide significant habitat for SAR. Minimal vegetation removal will be required as part of the Project at the densitometer site at KP 2989.30, and no loss of significant habitat for any noted SAR will be required as part of the Project. The potential interactions between the Project and SAR are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

Aquatic SAR that inhabit watercourses or wetlands within the Project Site LAAs are not anticipated to be impacted by the Project as work will not occur within 30 m of any waterbody known to support these species, and in-water works and waterbody crossings are not required during the construction or operation of the Project. Impacts resulting from potential releases of silt and sediment during construction and maintenance activities are anticipated to be localized and effects will be limited in duration.

5.9.1 Construction

The Construction phase of the Project has the potential to impact wildlife SAR through sensory disturbance and mortality. The following sections describe the potential impacts from the construction phase of the Project.

5.9.1.1 Sensory Disturbances

Sensory disturbances will occur from the visual disturbance of construction activities at each Project Site and along access roads, and the sound disturbance from operating machinery during construction (approximately seven month time frame). Visual disturbance will occur during the daylight hours and will be limited to the LAA for each site. Disturbances related to construction noise will be localized, limited in extent to the LAA for each Project Site, and to faunal species (i.e. bird, reptiles, mammals, amphibians) and reversible. Based on a desktop review of the NHIC database the following SAR may potentially be located within the LAAs of the Project Sites and as such may be impacted by sensory disturbances: Acadian Flycatcher; Bobolink; Henslow's Sparrow; Blanding's Turtle; Milksnake; Eastern Ribbonsnake; Snapping Turtle; and the Eastern Brownsnake. Redside Dace was the only SAR fish identified as potentially being located within one kilometer of the Project Sites. No watercourses that provide habitat for this SAR or other fish species at risk were noted in the PDAs of the Project Sites, and as such, sensory disturbances are not predicted to result in a significant residual effect on fish SAR.

Mitigation measures as outlined in the EGC (2012) such as maintaining equipment in proper working order, ensuring that mufflers are functioning as intended and completing works, where possible, during the winter and spring months, will further minimize sensory disturbances to adjacent SAR during construction. In addition, during construction Enbridge field staff and contractors will be provided with species description sheets to familiarize themselves with the protected species that may potentially occur in the vicinity of the Project Sites. Should field staff encounter any SAR in the vicinity of the PDAs, work in the area will cease and an on-call biologist will go to the site to advise on appropriate mitigation measures, as necessary, to ensure further work does not result in a negative effect on the noted species.

Negative effects on SAR are not anticipated at the site-specific extent since no suitable habitat has been identified within the PDAs for the Project Sites. Sensory disturbances related to noise emissions during construction may have a negative impact on SAR, but these will be short term in duration, local in extent, moderate in magnitude and reversible. Appropriate mitigation measures as outlined in **Table C-1** will also serve to reduce the potential for a negative effect on SAR during construction. Consequently, residual adverse effects as a result of construction on SAR is predicted to be negligible.

5.9.1.2 Mortality of Species at Risk

Mortality of SAR is highly unlikely due to there being no habitat present for any SAR at the Project Sites. As described in the EGC (2012), in the unlikely event of a wildlife encounter or collision with a SAR species, the incident will be reported to the Ontario MNR or MDDEP, and Environment Canada. Traffic in and out of each Project Site will be localized and of limited duration (approximately seven months). It is also anticipated that mobile SAR (i.e. faunal species) which may occur within the LAAs will likely avoid the Project Sites during construction. As a result, mortality of a SAR species, as a result of collisions during Project construction, is unlikely and the potential for SAR mortality is limited. Therefore, the residual effect of the Project on SAR populations during construction is negligible.

5.9.2 Operations

Impacts to SAR could result from sensory disturbance related to noise emissions during operations and minor increases to noise during standard maintenance activities. Disturbances of this nature will be limited to faunal SAR potentially located in the LAAs of the Project Sites (i.e. reptiles and birds). Project operations are predicted to result in similar noise emissions to existing levels with mitigation measures in place as required and will be in compliance with the applicable noise guidelines (subsection 5.2.2). Similarly to the construction phase of the Project, increases in noise emissions of moderate magnitude may also occur during maintenance activities (subsection 5.2.2). However, residual adverse effects as a result of maintenance activities are predicted to be not significant since the increase in noise emissions will be short-term, local in extent and reversible.

Since no permanent increase in noise levels is predicted for the operational phase of the Project (subsection 5.2.2), and the effects of maintenance activities on SAR are predicted to be short term and reversible, the Project is not predicted to result in a significant adverse residual effect on SAR as a result of sensory disturbances.

5.10 Socio-Economic

The Project activities during Construction, Commissioning and Operations will result in impacts to the socio-economic environment including traffic and employment. The potential interactions between the Project and the Socio-economic Environment are rated in **Table 5-2a and Table 5-2b** with the planned mitigation outlined in **Table C-1**.

5.10.1 Construction

Primary disruptions may result from noise, dust, additional traffic volume and congestion at all Project Sites. The most common sources of noise during construction are associated with the movement of heavy machinery and work equipment. As discussed in subsection 5.2.1, these short-term, construction related activities are exempt from the MOE and MDDEP noise criteria, but will be adjusted to adhere to municipal noise by-laws as required. A common nuisance of any construction project is fugitive dust generation as a result of trenching, boring and movement of heavy machinery. These short-term, reversible impacts of this effect are discussed in subsection 5.2.1.

The delivery of construction materials, equipment, and daily movement of construction workers in and out of the area are expected to cause slight increases in traffic in each LAA. Businesses within the LAA of each Project Site could be affected by construction activities due to potential traffic congestion. During construction, residents may experience a temporary disruption in the use and enjoyment of their property.

Daily traffic interruptions during the construction phase would primarily be due to any required lane closures to accommodate working space. However, since the majority of works will be completed within existing fenced-in facilities, this is likely to cause a temporary negative impact at the densitometer site at KP 2989.30 only. Since Settlers Road is not a major linear route, nuisance issues from traffic congestion are anticipated to be low in magnitude. Construction activities will result in an increase in traffic along the main access routes to the Project Sites. Trucks will be transporting materials on and off site; however, this activity would be short in duration taking place only during the construction period. Negative effects as a result of the Project would be short-term in duration, low-magnitude and reversible. Consequently, adverse residual effects are predicted to be not significant.

The construction workforce for the Project will accommodate a maximum of 40 people at each of the existing station and terminal Project Sites, 20 people at the existing densitometer site at MP 1860, and 30 people at the proposed densitometer site at KP 2989.30. Construction of the Project is anticipated to take place over a period of approximately seven months. Enbridge would seek to hire local workers first if feasible, before looking for labourers outside the community. This would provide temporary employment benefits to the local economies. Through the purchase of local materials, food and accommodation and short-term employment gain there will be indirect benefits through the increase of local contractors working in the areas of the Project Sites. As such, construction activities at all Project Sites may also result in a short-term positive residual effect on the socio-economic environment.

5.10.2 Operations

Impacts to the socio-economic environment during operations will be limited to operations and maintenance activities that will consist of activities similar to those during the construction phase of the Project including nuisance issues as a result of traffic, noise and dust. There are predicted minimal nuisance effects as a result of noise and/or fugitive dust emissions as a result of maintenance activities during the operational phase of the Project. Maintenance activities will

result in an increase in traffic along the main routes to the Project Sites; however, these activities would be intermittent, short term in duration and reversible. As a result, adverse residual effects of the Project on the socio-economic environment are predicted to be not significant.

Short-term employment opportunities and the purchase of local materials, food and accommodation may increase during periods of Project maintenance. In addition, it is anticipated that the Project will create three permanent employment positions. Consequently, Project operations may result in a short-term, positive residual effect on local resource use and long-term, positive residual effect on local employment and the socio-economic environment.

6 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

The following subsections discuss the anticipated effects of the environment on the Project and applied mitigation measure to minimize these effects.

Potential effects of the environment on the Project were identified for all phases of the Project over short-term and long-term timescales. The potential effects of wildlife encounters or human contact with noxious weeds are also assessed in the following subsections.

6.1 Effects of Adverse Weather on the Project

Short term climactic events were identified as the primary concern with regards to the effects of the environment on the Project, with impacts during the construction and operational phases of the Project ranging from delays in construction to damage to facilities.

6.1.1 Short-term severe weather events

In the short term, the primary impacts of the environment on the Project are the exposure of the Project Sites and of Enbridge and contract personnel to the elements including water, heat, freezing and thawing, high winds, and soil movement during severe weather events. These effects could occur during the construction and operations phases of the Project.

Severe weather events in the RAA would generally consist of heavy precipitation, blizzards, thunderstorms and lightning; however, these storm events are short-lived. During construction, heavy precipitation could potentially create ground conditions subject to rutting from the operation of equipment where soils are exposed (i.e. KP 2989.30). Extreme or persistent precipitation events could result in the delay of construction due to wet soil conditions. Should construction or maintenance activities be required during adverse weather conditions, mitigation measures to reduce the potential for soil erosion are outlined in **Table C-1**.

It is critical in addressing adverse weather to maintain effective communication between the construction contractor, the appropriate regulatory representatives and the stakeholders. Where severe weather conditions and activities have the potential to affect the Project or biophysical resources, Enbridge's on-site inspector will take appropriate action to prevent or mitigate potential adverse effects. Such action may include the suspension or modification of specific activities until weather conditions abate or effective mitigation procedures have been implemented.

6.1.2 Long-term Effects of Climate Change on the Project

In the long term, the effects of climate change could have a negative impact on the Project. Considerations included:

- change in the potential for extreme weather events such as wind, precipitation and temperature extremes;

- climate parameters that could change over the life of the Project, influencing the Project operating conditions and magnifying or buffering Project-related environmental effects; and,

- mitigation and adaptive management measures.

The Project would, where economically feasible, be designed to account for potential climate change effects such as temperature, precipitation, water levels and extreme winds, changes in groundwater and stream flow availability. The Project would have no effect on carbon sink capacity due to the small aerial footprint within existing fenced-in compounds and therefore will result in no decrease to vegetation relative to the rest of Canada.

The frequency of extreme weather events such as heavy downpours, floods, heat waves, droughts, tornadoes, and snowstorms is predicted to increase, with data already showing trends in this direction. The intensity of these events is also expected to increase, although the confidence in this prediction is relatively low. The number of heavy 24-hour and multiple day rainstorms is likely to increase steadily until at least the next century, by which time there may be twice as many of these rainstorms as there have been historically. The result of this heavy rainfall may be increased flooding, which may result in the need for innovative water control.

This increased extreme rainfall may be accompanied by long dry spells between storms, thus increasing droughts and heat waves in the region. A recent study has shown that the number of days in the Toronto-Niagara region of Southern Ontario with a temperature of over 30°C could double by 2030. Global climate predictions show wind and other climate trends that may tend toward the production of tornadoes and hurricanes.

The consideration of potential effects of climate change on stormwater management included the following:

- the potential for increasing frequency of more extreme precipitation events, potential effects of warmer temperatures on stormwater discharge, potential for the general decrease in snowpack depth and thus snowmelt, and potentially reduced requirements for winter de-icing agents; and,

- reduced requirements for de-icers, as well as project consideration of alternatives to road salt, would reduce chemical stresses to receiving waters.

The predicted changes to climate of increased temperatures, precipitation, river level and extreme winds, changes in groundwater and stream flow availability will not impact the operation of the Project.

6.2 Wildlife Encounters

The Project Sites are located across southern Ontario and southwest Quebec in areas that are previously disturbed by industrial and agricultural activities that do not generally provide preferred habitat for many wildlife species. As a result, the potential for wildlife encounters that may present a danger to Project personnel is limited.

As indicated in subsection 5.8 and 5.8.1.1, wildlife species that may be present within the Project Site LAAs are mobile and will likely avoid the Project Sites during construction due to short-term sensory disturbances. However, contractors and personnel will be trained in ways to minimize the potential for wildlife encounters (details provided in **Table C-1**) such as ensuring the fenced-in PDAs (where applicable) are secured from wildlife and garbage is not left on site.

6.3 Noxious Weed Encounters

During the construction, operation and maintenance phases of the Project, there is the potential for Enbridge or contractor personnel to encounter noxious weeds (e.g. poison ivy, wild parsnip, giant hogweed or stinging nettle). Contact with noxious weeds can result in significant allergic reactions in humans and the release of toxic chemical compounds into the human body. Several species of noxious weeds are typically found in disturbed areas and could be present within the PDAs of any Project Site.

All contractor and on-site personnel will be provided with information to help identify noxious weeds and be knowledgeable of the first-aid measures that should be taken should contact with the body occur. As outlined in subsection 5.6.2, Enbridge regularly conducts vegetation and weed removal as part of facility operations and maintenance as per the Enbridge LP Vegetation Management Guide.

Weed surveys may be conducted to identify weed species of concern and the extent of infestation prior to construction. Identification of weed concerns prior to construction assists with developing effective mitigation strategies to prevent contact and potential spread of weeds to new locations during construction. If required, mitigation measures would be developed in consultation with the Enbridge Environment Project Lead and, when necessary, a qualified biologist or appropriate regulatory authority.

7 ACCIDENTS, MALFUNCTIONS AND UNPLANNED EVENTS

A large part of Enbridge's daily operations is the prevention of any accidents, malfunctions and unplanned events. Enbridge constantly monitors the integrity of its facilities using a number of sophisticated methods and equipment. This equipment includes using computer systems called Supervisory Control and Data Acquisition ("SCADA") to monitor the facilities 24 hours a day, 365 days a year from the Control Centre in Edmonton. Enbridge also conducts regularly scheduled visual inspections and maintenance checks of all equipment at facilities.

Safe operations are a priority, to protect employees, neighbours and the environment. The Project would be designed and developed to prevent malfunctions or accidents to the extent possible. However, accidents, malfunctions, and unplanned events could occur as part of routine Project activities during any phase of the Project. Such events could occur as a result of abnormal conditions, wear and tear, human error, equipment failure, and other possible causes. Many accidents, malfunctions, and unplanned events are preventable and can be readily addressed through good planning, design, equipment selection, hazards analysis and corrective action, emergency response planning, and mitigation. Mechanisms designed and implemented to monitor and prevent any unforeseen events (malfunctions or accidents) may include:

- inspection and maintenance practices and procedures;
- operating and training practices and procedures;
- regular auditing protocols;
- safeguarding analysis and instrumentation;
- automated control systems;
- shutdown, isolation, and diversion protocols;
- data collection and monitoring systems, alerting staff to potential events that may lead to malfunctions or accidents;
- containment measures to isolate any potential accidental releases from interacting with the environment;
- on-site treatment and ponding systems preventing the discharge to the environment of any untreated emissions; and,
- Environmental Protection Plan ("EPP") and emergency response and contingency plans.

7.1 Methodology

In this section, the potential accidents, malfunctions, and unplanned events that could occur during any phase of the Project and potentially result in significant adverse environmental effects are described and assessed. The focus of the assessment is on credible accidents or scenarios that have a reasonable probability of occurrence, and for which the resulting environmental effects could be significant in relation to the identified thresholds of significance for each Valued Component (previously identified, as applicable).

The possible events identified in subsection 7.2 generally have a very low probability of occurrence and thus their environmental effects are of low likelihood. Moreover, they have an even lower probability or likelihood of occurring together.

Various credible accidents, malfunctions, and unplanned events have been selected to complete the assessment. Since it is impossible to review and assess all possible accidents, malfunctions and upset conditions, scenarios which represent higher consequence events that would more than adequately address the consequences of less likely or lower consequence scenarios have been addressed below.

7.2 Identification of Accidents, Malfunctions, and Unplanned Events

The accidents, malfunctions, and unplanned events that have been selected are based on experience and professional judgment, are as follows:

- **Hazardous Materials Spill**: spills of petroleum products, and/or other chemicals used on site that could occur during construction and during operation and maintenance.
- **Failure of Erosion and Sediment Control ("ESC") Measures**: the failure of Project-related mitigation measures that are deployed to prevent soil erosion or sedimentation by surface runoff during construction of the Project.
- **Fire**: includes a fire as a result of the construction, maintenance and operations of the Project. The focus is on the consequence, and not the mechanism by which it occurs.
- **Vehicle Accident**: vehicle accidents that could occur during construction and operations on road transportation network, including vehicle accidents involving wildlife.
- **Wildlife Encounter**: encounters by workers with wildlife during construction or operation and maintenance, including wildlife strikes.
- **Discovery of Heritage Resource**: the discovery of a previously undiscovered heritage or archaeological resource that could occur during construction and to a lesser extent during operation and maintenance.

As part of contingency planning for the Project, an EPP will be developed that describes the environmental protection measures to be used during the construction phase of the Project. In addition, the EPP will be designed to prepare the Environmental or Construction Inspectors, Project personnel and contractors with the necessary means to identify events where special contingency plans and responses are required and provide reference to more detailed information.

Subsections 7.2.1 through 7.2.6 describe emergency response, contingency plans and response action items for the potential accidents, malfunctions and unplanned events identified above. Detailed mitigation and prevention measures are provided in **Table C-1**.

7.2.1 Fuel and Hazardous Materials Spills

Should an accident or malfunction occur resulting in the spill of fuel or other hazardous materials during the construction or operation of the Project, contingency and clean-up and mitigation would be implemented as per the Enbridge Operating and Maintenance Procedures Book 7: Emergency Response, filed with the NEB. Potential environmental effects of a spill, including extent and duration, are determined by site-specific conditions at the time of the malfunction. The successful containment and mitigation of a spill is dependent on a variety of factors including: ground cover and topography; hydrogeology; solubility of the material; viscosity of the liquid; water currents; soil permeability and climatic conditions. All Enbridge personnel and contractors must have contingency measures satisfactory to Enbridge for responding to possible emergencies, and adequate equipment and supplies capable of cleaning up spills on land and water.

In the event of a leak or spill, the reporting and notification procedures will be implemented as identified in Enbridge's Operating and Maintenance Procedures Book 1: General Reference filed with the NEB. General guidelines for the containment and clean-up of hazardous materials are outlined in **Table C-1**.

7.2.2 Failure of Erosion and Sediment Control Measures

During construction, the Environmental or Construction Inspector will be responsible for supervising and monitoring installation and maintenance of all erosion and sediment control ("ESC") structures. If wind or water erosion is evident during the construction phase of the Project, all necessary contractor equipment and personnel will be made available to control the erosion. During the construction phase, the Environmental or Construction Inspector will determine appropriate measures to be implemented, as needed, for the following situations:

- potential sedimentation of waterbodies due to snowmelt, spring runoff, and storm events;
- embankment or slope failures;
- wind erosion; and,
- failure of mitigation measures.

Similar procedures should be followed during the operational phase of the Project as needed.

7.2.3 Fires

Enbridge personnel and contractor crews will be trained in fire prevention and response. In the event of a fire, emergency response measures will be implemented as per the Enbridge Emergency Response Procedures Book 7, on file with the NEB. Detailed mitigation measures are provided in **Table C-1**.

7.2.4 Vehicle Accident

A Vehicle Accident could potentially occur during all phases of the Project. Worker traffic and truck traffic to and from the site, and the operation of heavy equipment on-site during construction, have the potential to result in a vehicle accident during construction, operations or maintenance activities.

The Project-related vehicles will observe all traffic rules and provincial and federal highway regulations. Trucking activity for construction of the Project will take place on designated truck routes, and observe speed limits and weight restrictions.

As the Project will comply with all applicable traffic rules and regulations, the likelihood of a vehicle accident during construction, operation and maintenance of the Project is assessed to be not significant.

7.2.5 Wildlife Encounter

Enbridge and contractor personnel will be trained in ways to prevent a wildlife encounter from occurring. In the event that wildlife and wildlife species of concern or their site-specific habitat features (nests, mineral licks, or dens) are discovered during construction or operation activities, the discovery will be assessed and mitigation measures will be followed as per those outlined in **Table C-1**.

7.2.6 Heritage and Archaeological Resources

In the event that archaeological, historical or palaeontological resources are inadvertently discovered, all work in the area will immediately cease until the proper authorities have completed their investigations. Consultation with First Nations, the Ontario Ministry of Tourism, Culture and Sport and the Quebec *Ministère de la Culture, des Communications et de la Condition féminine du Québec* is a requirement prior to and during all heritage resource assessments.

8 CONCLUSION

The Project is not anticipated to result in a significant negative residual environmental effect. Emissions that may affect air quality due to construction and operation activities are anticipated to be minor. Noise emissions from construction activities will result in a minor increase over ambient conditions; however, the emissions will short term, localized in extent and reversible. In addition, the typical hours of construction will be adjusted, if required, to meet applicable by-law noise limits, where possible. Residual effects on the acoustic environment as a result of Project operations are expected to be negligible compared to existing background noise emissions and are expected to meet applicable provincial guidelines.

The majority of the construction activities will occur within existing, fenced-in, graveled areas that have been previously disturbed. As a result, effects to soils, vegetation, wetlands, wildlife and wildlife habitat, and SAR and SAR habitat, are not anticipated to result in a residual effect at the existing Project Sites. Where negative residual effects may occur as a result of the permanent loss of productive soils and vegetation at the proposed densitometer site at KP 2989.30 (MP 1857.47), the area of loss will be small compared to the area that will remain actively used for agricultural production. Short-term and long-term positive residual effects on the socio-economic environment may occur as a result of the Project due to increases in the purchase of local goods and constructions supplies for the duration of Project construction as well as the creation of three permanent employment positions.

Mitigation measures described in the EGC (2012) will reduce the effects of the Project on the environment. These measures include installation of siltation fencing around the work areas, timing construction activities to be outside of critical time periods for wildlife and to reduce nuisance effects as a result of noise and traffic on local residents, and maintaining vehicles in good working order.

9 CLOSURE

This report has been prepared for the sole benefit of Enbridge Pipelines Inc., and may not be used by any third party without the express written consent of Enbridge Pipelines Inc. Any use which a third party makes of this report is the responsibility of such third party.

The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of our report. In the event that changes or alterations are made to the project, we reserve the right to review our data with respect to any such changes.

Respectfully Submitted,

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