15.0 ASSESSMENT OF CUMULATIVE ENVIRONMENTAL EFFECTS

15.1 SCOPE OF ASSESSMENT

The residual environmental effects of the Project that may interact cumulatively with the residual environmental effects of other projects or physical activities that have been or will be carried out are identified in this section, and the resulting cumulative environmental effects are assessed.

An assessment of cumulative environmental effects is warranted if:

- the Project is assessed as having residual environmental effects on one or more VCs, whether those residual environmental effects are significant or not; and
- the residual environmental effects of the Project on the VCs could act cumulatively with the residual environmental effects of other past, present, or reasonably foreseeable future projects or activities.

The environmental effects of past and present projects or activities on VCs have been generally considered in the description of existing conditions as applicable for each VC.

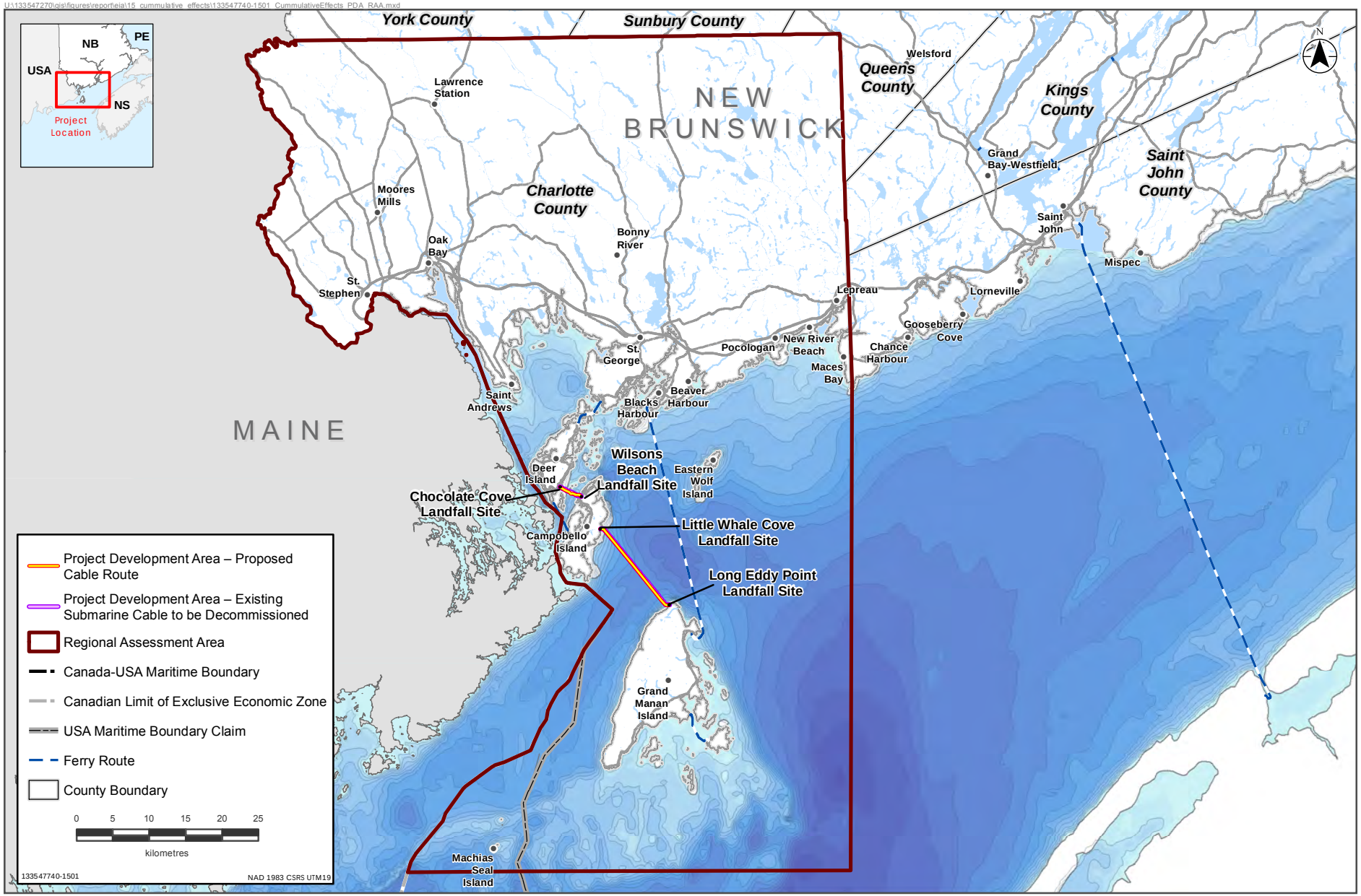
15.1.1 Boundaries

The regional assessment area (RAA) is the area within which potential cumulative environmental effects—defined as the residual environmental effects of the Project in combination with those of past, present, or reasonably foreseeable projects—are assessed. For the purpose of the cumulative environmental effects assessment, the RAA for this Project includes the Fundy Isles, Passamaquody Bay, Charlotte County, and the southwestern portion of the Bay of Fundy to a point immediately south of Machias Seal Island, within Canadian jurisdictional waters (Figure 15.1). This RAA has been selected because it encompasses the PDA and LAAs of all VCs assessed for the Project, and because it covers an area within which Project-related environmental effects may overlap or accumulate with the environmental effects of other projects or activities that have been or will be carried out.

Temporal boundaries for the assessment of cumulative environmental effects are the same for each VC as identified in this EIA Report. These temporal boundaries encompass periods of construction, operation and maintenance, and decommissioning and abandonment of the Project.

15.1.2 Significance Criteria

Thresholds of significance for the assessment of cumulative environmental effects are the same as for each VC, as identified in this EIA Registration.



Source Data: Data provided by the Governments of New Brunswick and Canada.

Regional Assessment Area

Stantec

133547740 - Fundy Isles - NB Power

Figure 15.1

15.1.3 Description of Other Projects or Activities

Future projects or activities were considered if the study team considered them to be reasonably foreseeable, as follows:

1) they have been publicly announced with defined project execution period and with sufficient project details available publicly that allow for a meaningful environmental effects assessment;

2) they are currently undergoing an environmental assessment, either federally or provincially, and information on those environmental assessments is available publicly; or

3) they are currently in a known permitting process.

A review of the websites of the New Brunswick Department of the Environment and Local Government (NBDELG; http://www2.gnb.ca/content/gnb/en/departments/elg/environment/content/environmental_impactassessment/registrations.html)) and the Canadian Environmental Assessment Agency (CEA Agency; http://www.ceaa-acee.gc.ca/050/index-eng.cfm) conducted on November 15, 2017 revealed there is one project within the RAA that may result in residual environmental effects that might overlap those of the Project to cause cumulative environmental effects.

In addition to registered projects, there is one publicly announced project within the RAA that may result in residual environmental effects that might overlap those of the Project to cause cumulative environmental effects.

Table 15.1 describes each project that might overlap with the proposed Project.

Table 15.1 Reasonably Foreseeable Future Projects with Environmental Effects That Might Overlap those of the Proposed Project

Name of Potential Project	Project Description	Location
Conceptual Development of Commercial-Scale Culture Methodologies for White Pacific Shrimp in Land-Based Intensive Saltwater Recirculation Systems	A land-based commercial-scale production model for commercial culture of White Pacific Shrimp.	Leonardville, Deer Island, NB
Atlantic Link	The development of a 1,000-megawatt capacity submarine high-voltage direct current (HVDC) electrical transmission line to the United States, proposed by Emera Inc. The Project will deliver electrical energy from a new converter station to be constructed at Coleson Cove near Saint John, to a new converter station at the former Pilgrim Generating Station in Plymouth, Massachusetts, via a new submarine cable. The submarine cable will be approximately 600 km long.	Coleson Cove, NB to Plymouth, Massachusetts

In addition to the two potential future projects with environmental effects that might overlap those of the proposed Project identified in Table 15.1, the study team identified six broad categories of past, present, or reasonably foreseeable future activities with which the residual environmental effects of the Project will be assessed, but for which no specific project is currently proposed. These broad categories of activities have been selected based on the nature of the residual environmental effects of the Project that may overlap those of other projects or activities, as well as the study team's knowledge of current activities taking place in the region. The six broad categories of past, present, or reasonably foreseeable future physical activities that have been identified as having the potential to result in residual environmental effects that may act cumulatively with those of the Project are:

- industrial development;
- commercial fisheries;
- aquaculture;
- commercial shipping;
- recreational use; and
- commercial and residential development.

Further details on these broad categories of past, present, or future projects or activities are provided below.

15.1.3.1 Industrial Development

The closest industrial facilities to the PDA are the NB Power Thermal Station on Grand Manan (approximately 15 km southeast of the Project), the Lake Utopia Paper Corrugated Cardboard Mill near St. George (approximately 28 km north of the Project), the Flakeboard Particle Board and Fibreboard Mill in St. Stephen (approximately 35 km northwest of the Project), the Ganong Bros. chocolate factory in St. Stephen (approximately 32 km northwest of the Project), and the NB Power Point Lepreau Nuclear Generating Station at Point Lepreau (approximately 40 km northeast of the Project).

According to the NBDELG's database of EIA registrations (available at http://www2.gnb.ca/content/gnb/en/departments/elg/environment/content/environmental_impactassessment/registrations.html), other than projects listed in Table 15.1 above, no new planned industrial developments have been identified based on a review of projects that have been registered under the EIA Regulation (as of November 15, 2017).

Due to the limited potential for interaction between the Project and industrial development in the RAA, the negligible emissions expected from the Project, and given the distance to other existing industrial emitters resulting in limited magnitude of environmental effects that might overlap spatially and temporally with those of the Project, industrial development is not carried forward in the cumulative environmental effects assessment. The cumulative environmental effects of the Project in combination with those of past, present, and future industrial development activities for all phases of the Project and for all VCs affected are rated not significant, and are not discussed further.

15.1.3.2 Commercial Fisheries

Fishing is one of the largest industries on Deer, Campobello and Grand Manan Islands and a key economic driver in southwestern New Brunswick. A large component of marine vessel use in the LAA comes from commercial, recreational, and Aboriginal (CRA) fishing activities. These activities are described in more detail in the CRA Fisheries VC (Section 11.0).

There are commercial fishing harbours at Chocolate Cove and Wilsons Beach, as well as a fish processing plant at Wilsons Beach near the PDA.

Given the amount of fishing activity in the Bay of Fundy, and the potential for the environmental effects of the Project to overlap with those of past, present, or future commercial fisheries, this activity is carried forward in the cumulative environmental effects assessment.

15.1.3.3 Aquaculture

Aquaculture production in the Bay of Fundy is primarily for Atlantic salmon, centred largely around Blacks Harbour on mainland southern New Brunswick with some installations off Grand Manan. Eight aquaculture leases overlap with the southern edge of the LAA, but no aquaculture leases are crossed by the marine PDA; the nearest aquaculture facility is located approximately 0.93 km south of the PDA.

Given the amount of aquaculture leases within the Bay of Fundy, and the potential for the environmental effects of the Project to overlap with those of past, present, or future aquaculture activities, this activity is carried forward in the cumulative environmental effects assessment.

15.1.3.4 Commercial Shipping

Within the Bay of Fundy, there are two established shipping lanes—one for entry to the Bay and one for departure from the Bay. These lanes are located east and southeast of Grand Manan Island and travel north towards the Port of Saint John. Shipping activity also occurs through the Passamaquoddy Bay leading to the Port of Bayside near St. Andrews, although to a much lesser level of activity than that travelling to and from the Port of Saint John.

The western side of Grand Manan Island serves as an alternative entrance to the Bay of Fundy for vessel traffic. Vessels can enter the Bay by entering the Gulf of Maine, traveling up the Grand Manan Channel on the western side of Grand Manan Island, to Head Harbour Passage.

Given the high traffic shipping lanes in the Bay of Fundy, and the potential for the environmental effects of the Project to overlap with those of past, present, or future commercial shipping activities, this activity is carried forward in the cumulative environmental effects assessment.

15.1.3.5 Recreational Use

Many tourist operations, particularly wildlife and whale watching tours, and recreational fishing charters, are based in the Fundy Isles and the nearby town of St. Andrews, and may make use of Head Harbour Passage (which separates Deer Island from Campobello Island) and Grand Manan Channel (which separates Campobello Island from Grand Manan Island). These tours highlight the many wildlife species present in the area including whales, seals, and marine birds as well as the many lighthouses and natural features present along the coast of the Fundy Isles. Other recreational boating activities are also likely in the area, and recreational vessels may make use of the harbours at Chocolate Cove and Wilsons Beach.

The Fundy Isles are home to many outdoor recreation opportunities. There are many hiking, cycling, and walking trails throughout the area, as well as many public and private beaches used for recreation, beachcombing, and kayaking. Diving and guided diving tours are also available. The Fundy Isles are also a popular camping destination with a variety of public and private campgrounds available. Anchorage Provincial Park, located on Grand Manan Island, includes many walking and hiking trails, a beach, and is home to the Grand Manan Migratory Bird Sanctuary, a well-known bird watching destination. Bird watching is also a common activity throughout the Fundy Isles as the area serves as a stopping point for migrating birds along their migratory routes. Herring Cove Provincial Park, and Roosevelt Campobello International Park are both located on Campobello Island and are both frequently used recreation destinations.

Given the high tourism and outdoor opportunities in the Fundy Isles, and the potential for the environmental effects of the Project to overlap with those of past, present, or future recreational use, recreational use is carried forward in the cumulative environmental effects assessment.

15.1.3.6 Commercial and Residential Development

There are limited residential areas near the PDA at the Chocolate Cove, Little Whale Cove and Long Eddy Point landfall sites. There are residential areas namely surrounding the Wilsons Beach landfall site

(Figure 5.2). As the Village of Grand Manan and Campobello Island populations are shrinking (see Section 9.5.2.2), large scale residential developments in the short-term are unlikely. Contrary to this trend, the population of West Isles (which includes Deer Island) is growing.

The Fundy Isles are a popular tourist destination and a variety of motels, inns, cottages, and bed and breakfasts operate on each island to accommodate tourists. There are several campgrounds on both Grand Manan Island and Campobello Island. If Fundy Isles tourism grows, there may be potential for both commercial and residential (campgrounds are now considered as residential property in New Brunswick) development in the future.

Given the high tourism activity in the Fundy Isles, and the potential for the environmental effects of the Project to overlap with those of past, present, and future commercial and residential developments, commercial and residential development is carried forward in the cumulative environmental effects assessment.

15.2 IDENTIFICATION OF POTENTIAL CUMULATIVE ENVIRONMENTAL EFFECTS INTERACTIONS

Based on the assessments presented in Sections 5.0 to 12.0, the following seven VCs are anticipated to have residual environmental effects, and a cumulative environmental effects assessment was therefore undertaken:

- atmospheric environment;
- terrestrial environment;
- marine environment;
- water resources;
- socioeconomic environment;
- commercial, recreational, and Aboriginal fisheries; and
  current use of land and resources for traditional purposes by Aboriginal persons.

Interactions between the Project and heritage resources are not anticipated to result in cumulative residual environmental effects with any other project or activity listed in Table 15.2. The zone of influence of the Project on heritage resources is limited to the PDA. In order for a cumulative environmental effect to occur on heritage resources, the environmental effects of other projects or activities would necessarily need to overlap the Project's PDA, by the very nature of heritage resources which is focused on an area of disturbance caused by a Project which may uncover heritage resources if they were present. In light of the mitigation that will be implemented for the Project regarding potential heritage resources, and since there will be no other projects or activities in the PDA other than the Project, there is no potential for overlapping cumulative environmental effects to occur with other projects or activities. An assessment of cumulative environmental effects on heritage resources is therefore not required.

Table 15.2 highlights the potential for interactions between the residual environmental effects of the Project and the past, present, or future projects or activities identified.

Table 15.2 Potential Cumulative Environmental Effects Interactions Among Valued Components and Past, Present, or Future Projects or Activities

Past, Present, or Future Project or Activity	Valued Components						
	Atmospheric Environment	Terrestrial Environment	Marine Environment	Water Resources	Socioeconomic Environment	Commercial, Recreational, and Aboriginal Fisheries	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons
Atlantic Link Project, NB Portion	-	-	-	-	-	-	-
Commercial-Scale Culture Methodologies for White Pacific Shrimp in Land-Based Intensive Saltwater Recirculation Systems, Deer Island, NB	-	-	-	-	-	-	-
Commercial Fisheries	-	-	✓	-	✓	✓	✓
Aquaculture	-	-	✓	-	✓	✓	✓
Commercial Shipping	✓	-	✓	-	✓	✓	✓
Recreational Use	-	-	✓	✓	✓	✓	✓
Commercial and Residential Development	✓	✓	-	✓	✓	-	✓

NOTES:

✓ indicates that the residual environmental effects of the Project on the VC might overlap spatially or temporally with the residual environmental effects of other projects or activities, and therefore a cumulative environmental effects assessment is required.

- no interaction

Past, present, and future projects or activities that have been identified in Table 15.2 as having a potential interaction with the environmental effects of the Project for one or more VCs have been carried forward in the cumulative environmental effects assessment. Those past, present, or future projects or activities for which no interaction was identified for any VC in Table 15.2 are not carried forward in the cumulative environmental effects assessment either because they do not overlap spatially or temporally with the environmental effects of the Project, or in light of very low magnitude residual environmental effects of the Project or other projects or activities that would result in negligible cumulative environmental effects. A justification for those projects or activities that were identified as not having an interaction with any VC in Table 15.2 is provided below.

Project details (i.e., scheduling and routing) for the Atlantic Link Project have not yet been confirmed and therefore cannot be assessed cumulatively with the Project. Construction of the Project would occur well before any activity on Atlantic Link, and there is limited potential for those projects to overlap spatially in any meaningful way in the RAA that would cause overlapping cumulative environmental effects on any VC. As there is no spatial or temporal overlap expected between the Project and Atlantic Link such that there would be any interaction with any of the valued components (VCs) listed in Table 15.2, the Atlantic Link is not carried forward in the cumulative environmental effects assessment.

The White Pacific Shrimp Saltwater Recirculation Systems Project is not likely to act cumulatively with the Project, as there are not expected to be overlapping interactions with any of the VCs listed in Table 15.2. The recirculation system will be a land-based system over 3 km north of the Project on residential land and will use a drilled residential well on site. As there is no spatial overlap expected between the Project and the White Pacific Shrimp Saltwater Recirculation Systems Project such that there would be any interaction with any of the VCs listed in Table 15.2, the White Pacific Shrimp Saltwater Recirculation Systems Project is not carried forward in the cumulative environmental effects assessment.

In summary, those past, present, or future activities for which no interaction with a VC was identified in Table 15.2 are not expected to overlap spatially or temporally with the environmental effects of the Project, and are not carried forward in the cumulative environmental effects assessment. The cumulative environmental effects of the Project in combination with those of the Atlantic Link project and the White Pacific Shrimp Saltwater Recirculation Systems Project, for all phases of the Project and for all VCs affected, are rated not significant and are not further discussed in this assessment.

15.3 ASSESSMENT OF CUMULATIVE ENVIRONMENTAL EFFECTS

Past or present projects or activities that have been or are being carried out have influenced the baseline conditions for the assessment of Project environmental effects, as documented in the existing conditions section of each preceding VC section. Since the environmental effects of past or present projects or activities are largely encompassed within existing conditions for each VC, the environmental effects of other projects or activities that have been or are being carried out (i.e., past and present environmental effects) in combination with the environmental effects of the Project are considered in the assessment of the residual environmental effects of the Project and are thus not duplicated below. The focus of the discussion below will thus be on the cumulative environmental effects of the Project in combination with reasonably foreseeable projects or activities.

It is important that the discussion that follows only considers those projects or activities that were identified in Table 15.2 as having a potential interaction with the particular VC being assessed.

15.3.1 Cumulative Environmental Effects on the Atmospheric Environment

15.3.1.1 Residual Project Environmental Effects Summary

As detailed in Section 5.0, the residual environmental effects of the Project on the atmospheric environment during construction include the release of criteria air contaminants (CACs), greenhouse gases, and noise above current conditions. Residual environmental effects of the Project on the

atmospheric environment during decommissioning are similar to those arising during construction. The residual environmental effects of the Project on the atmospheric environment during operation and maintenance are negligible and are not discussed further.

The CAC emissions during construction are low in magnitude in comparison to the emissions in the region, as reported to the National Pollutant Release Inventory (NPRI) maintained by Environment and Climate Change Canada. Over the construction period, other than for possible short term periods of impaired ambient air quality that might arise from long range transport of air contaminants from the Eastern Seaboard of the United States, these emissions are not likely to cause poor air quality in the RAA as they are low in magnitude and mitigation would be used to control emissions from the Project. Since there have been no exceedances of ambient air quality objectives at the nearest ambient air quality monitoring station in St. Andrews in recent years, and since North American emissions have been steadily declining in recent decades, potential overlap of the emissions of the Project with those arising from long range transport is highly unlikely to occur. The CAC emissions during decommissioning are expected to be similar or less than those that would occur during construction.

Greenhouse gas emissions from the construction of the Project are very low and not measurable in comparison to other industrial or transportation sources in New Brunswick. GHG emissions during decommissioning are expected to be similar or less than those that would occur during construction.

Use of large equipment and vehicles during construction would emit sound. Noise would be short in duration and would generally occur inside the PDA and immediately adjacent areas. Construction activities would be restricted to daytime hours (7 am to 7pm, where possible) to lessen the disturbance to nearby residences. Potential cumulative environmental effects of noise are unlikely to extend beyond the LAA (within 500 m). Noise emissions during decommissioning are expected to be similar or less than those that would occur during construction.

15.3.1.2 Cumulative Environmental Effects during the Construction Phase

During construction, commercial shipping activities in the area are expected to be ongoing and similar to past and present activities in terms of contribution to air quality, GHGs, and noise, and those environmental effects are encompassed in existing conditions for the atmospheric environment.

During construction, commercial and residential development activities in the area are expected to be similar to past and present activities in terms of contribution to air quality, GHGs, and noise, and those environmental effects are encompassed in existing conditions for the atmospheric environment.

Commercial shipping and commercial and residential development activities in the area are therefore not expected to act cumulatively with the atmospheric environment during the construction phase of the Project.

15.3.1.3 Cumulative Environmental Effects during the Decommissioning Phase

During decommissioning, if the existing submarine cables are removed, commercial shipping activities may interact cumulatively with the atmospheric environment from an increase in CAC emissions, GHGs, and noise emissions. The decommissioning phase, however, would be short in duration (up to five days,

depending on the method of decommissioning) and therefore not expected to act cumulatively with commercial shipping activities in the RAA. If the existing submarine cables are abandoned, no cumulative environmental effects are expected with commercial shipping.

During decommissioning, if the existing submarine cables are removed, commercial and residential development may interact cumulatively with the atmospheric environment from an increase in CAC emissions, GHGs, and noise emissions. The decommissioning phase, however, would be temporary and short in duration and therefore not expected to act cumulatively with commercial shipping activities in the RAA. If the existing submarine cables are abandoned, no cumulative environmental effects are expected with commercial and residential development.

15.3.1.4 Summary of Cumulative Environmental Effects for Atmospheric Environment

In light of the above, overlapping cumulative environmental effects on the atmospheric environment during construction and decommissioning of the Project are not anticipated.

Other future projects or activities would be subject to approvals and permits which would determine the acceptability of their environmental effects and prescribe any required mitigation. Cumulative environmental effects between the Project in combination with other past, present or future activities (commercial shipping and commercial and residential development activities) on the atmospheric environment during all phases of the Project are therefore not expected to be substantive, and are rated not significant.

15.3.2 Cumulative Environmental Effects on the Terrestrial Environment

15.3.2.1 Residual Project Environmental Effects Summary

The residual environmental effects of the Project on the terrestrial environment during construction of the Project include a temporary and permanent disturbance to vegetation and wildlife habitat in the PDA, and a minor residual environmental effect on SAR and SOCC in the LAA. There are no substantive residual environmental effects of the Project on the terrestrial environment during operation that were not initially introduced during construction, thus cumulative environmental effects are not expected during operation.

Assuming the OCT method is used for landfall construction, construction activities would result in a disturbance to approximately 0.42 ha of vegetation communities and wildlife habitat. This includes coastal land, anthropogenic land, existing transmission line RoW, mature – overmature mixedwood forest, and young – immature hardwood forest.

If HDD installation is used, the cable riser station expansion is expected to result in direct disturbance to and permanent loss of 0.14 ha of land. This includes transmission line RoW, anthropogenic land class, and mature – overmature mixedwood.

Construction and decommissioning of the Project may result in the loss of several individuals of a vascular plant SOCC within the PDA. Kalm's hawkweed was noted within the PDA in a disturbed area, an existing power line. Although Kalm's hawkweed was not noted in any other locations surveyed in support of the Project, its preference for disturbed habitats suggests it likely exists in other locations within the

LAA. In addition, it is unlikely to be affected by the Project if the HDD method of cable installation is used, as planned, as it would be flagged and avoided. Therefore, the loss of these individuals is not expected to occur; if loss did occur, the loss of these individuals would not be expected to have population-level effects on this species in the LAA or surrounding ecodistrict.

Because the various areas of the PDA are already disturbed and with the application of mitigation outlined in Section 6.7.2.2, potential issues and concerns related to soil compaction and invasive plant introduction are reduced.

15.3.2.2 Cumulative Environmental Effects during the Construction and Decommissioning Phases

Although construction and decommissioning of the Project would result in both temporary and permanent loss of vegetation communities and wildlife habitat, it is not expected to contribute to habitat fragmentation, as the landfall sites are generally in fragmented habitats, the cable riser stations are already on a disturbed footprint (though it would be expanded slightly for the Project), and there is no interior forest within the PDA.

The PDA would be cleared outside of the breeding season for migratory birds, and thus interactions with breeding birds, including SAR and SOCC, would be limited to a small reduction in available habitat related to the increased footprint of the existing cable riser stations, and sensory disturbance associated with construction activities. Wildlife species are not expected to be restricted by a lack of suitable available habitat within the LAA, as the land components of the PDA are in areas with existing levels of ambient noise, and similar habitats are not lacking in surrounding areas.

Future commercial and residential development activities are likely to result in similar environmental effects on the terrestrial environment, though the extent of spatial or temporal overlap with those of the Project would determine whether cumulative environmental effects might occur. However, these potential developments are unlikely to result in substantive environmental effects on the terrestrial environment in such a manner as to cause a measurable change from existing conditions that would be above regulatory thresholds or that would affect the ongoing viability of populations and habitats in the RAA.

15.3.2.3 Summary of Cumulative Environmental Effects for Terrestrial Environment

In consideration of the residual environmental effects of the Project on the terrestrial environment, the ecological context of the Project, and the very limited number of other likely projects or activities in the RAA, the potential cumulative environmental effects of the Project in combination with other past, present or future activities (residential and commercial development) on the terrestrial environment during all phases of the Project are not expected to be substantive, and are rated not significant.

15.3.3 Cumulative Environmental Effects on the Marine Environment

15.3.3.1 Residual Project Environmental Effects Summary

The residual environmental effects of the Project on the marine environment during construction and decommissioning of the Project include physically altering marine benthic habitat and the marine acoustic environment from trenching activities and increased marine traffic. Marine emissions and wastes released during construction and decommissioning also have the potential to alter water quality and sediment quality and alter habitat for marine species.

The installation of the marine cables may result in the direct disturbance of up to 32,120 m^2 and 142,100 m^2 of seabed for the Head Harbour Passage and Grand Manan Channel, respectively. It is expected that open-cut trenching (if applicable) and cable burial would cause an initial effect on benthic community composition immediately after trenching/ploughing.

Operation of the Project is expected to result in the generation and emission of electromagnetic fields (EMF) and increased vessel traffic for cable inspection, maintenance and repair activities. Effects on marine populations may result from electric and magnetic fields emanating from the cable or through changes in the underwater acoustic environment from marine vessel traffic.

Partial burial of the cable, on a best attempt effort, approximately 0.6 m beneath the seabed in the Grand Manan Channel crossing is anticipated to reduce the magnitude of potential residual adverse environmental effects. Considering the lack of demonstrated adverse effects and the limited spatial extent of induced electric fields associated with 69 kV high voltage AC cables and the mitigation planned by Project design (i.e., cable sheathing, armouring), the residual adverse environmental effects of induced electric fields on CRA and SOCC species and changes to their population are expected to be not significant.

The activities required to decommission the existing submarine cables (if it is decided to do so) would be similar in scope to the activities conducted during construction. Should the existing cables be decommissioned in place, any environmental effects on the marine environment would be shorter in duration than during construction.

15.3.3.2 Cumulative Environmental Effects during the Construction Phase

During construction, commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are expected to be ongoing and similar to past and present activities in terms of changes to marine populations, and those environmental effects are encompassed in existing conditions for the marine environment.

Commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are therefore not expected to act cumulatively with the marine environment during the construction phase of the Project.

15.3.3.3 Cumulative Environmental Effects during the Operation Phase

The existing submarine cable between Deer Island and Campobello Island would remain in standby service and operate in conjunction with the proposed submarine cable only on an as-needed basis. While both submarine cables are in operation, there would be generation and emission of EMF from both submarine cables. However, as discussed in Section 7.7.2, an average 69 kV cable buried laid on the seafloor has a predicted magnetic field of approximately 8 µT 1 m above the cable and decreases to 1.5 µT at a distance of 4 m and 0.2 µT at 10 m (Normandeau et al. 2011). The magnetic fields from both the submarine cables would both decrease to near background levels with distance and therefore not act cumulatively in the marine environment.

Commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are not expected to act cumulatively with the Project during operation, as these activities would not generate EMF.

15.3.3.4 Cumulative Environmental Effects during the Decommissioning Phase

During decommissioning, if the existing submarine cables are removed, commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area may act cumulatively with the marine environment from a change in marine populations. The decommissioning phase, however, would be temporary and short in duration (up to five days, depending on the method of decommissioning) and therefore not expected to act cumulatively with these activities in the RAA. If the existing submarine cables are abandoned, no cumulative environmental effects are expected.

15.3.3.5 Summary of Cumulative Environmental Effects for Marine Environment

Other future projects or activities would be subject to approvals and permits which would determine the acceptability of their environmental effects and prescribe any required mitigation. Cumulative environmental effects of the Project in combination with other past, present or future activities (including commercial fisheries, aquaculture, commercial shipping, and recreational use) on the marine environment during all phases of the Project are therefore not expected to be substantive, and are rated not significant.

15.3.4 Cumulative Environmental Effects on Water Resources

15.3.4.1 Residual Project Environmental Effects Summary

The installation of the cable using the HDD method may result in interactions between the Project and groundwater due to the possible introduction of a preferential pathway for groundwater flow. The use of drilling muds to circulate drill cuttings would also serve to hydraulically isolate the borehole as a result of the deposition of drilling mud on the borehole walls. These effects are anticipated to be limited to within the LAA.

If OCT is used, the trenches may require some limited dewatering during the period of construction. Where dewatering occurs, local water table elevations would be temporarily lowered during dewatering

activities. Thus, a temporary and localized interaction between the Project and groundwater resources would occur.

Modification to cable riser stations during construction may require temporary dewatering in excavations to expand the base of the cable riser station. Thus, a temporary and localized interaction between the Project and groundwater resources could occur. Where dewatering occurs, local water table elevations would be temporarily lowered during construction, and could extend to nearby water wells.

As detailed in Section 8.9, the Project is not expected to result in residual environmental effects to water resources during construction. Residual environmental effects of the Project on water resources during operation and decommissioning are not expected and are not discussed further.

15.3.4.2 Cumulative Environmental Effects during the Construction Phase

Recreational use and commercial and residential development activities are unlikely to present environmental effects to groundwater in the LAA for groundwater, and therefore overlapping cumulative environmental effects on groundwater during construction of the Project is not anticipated.

15.3.4.3 Summary of Cumulative Environmental Effects for Water Resources

Other future projects or activities are not expected to act cumulatively to affect groundwater as there is little to no spatial overlap between the residual environmental effects of the Project on groundwater and those arising from other projects or activities. Therefore, cumulative environmental effects of the Project in combination with other past, present, or future projects or activities (recreational use and commercial and residential development) on groundwater during all phases of the Project are not expected to be substantive, and are rated not significant.

15.3.5 Cumulative Environmental Effects on the Socioeconomic Environment

15.3.5.1 Residual Project Environmental Effects Summary

The Project would affect the socioeconomic environment during construction, resulting in short-term access restrictions to portions of the PDA, affecting land use, including recreational land use. However, there is unlikely to be any overlap with any potential environmental effects of other projects or activities on land use. There are no substantive residual environmental effects of the Project on the socioeconomic environment during operation or decommissioning that were not initially introduced during the construction phase.

There are many recreational activities which take place within the RAA. Several of these activities are related particularly to recreational boating and marine tourism activities (e.g., whale watching tours). During construction, the access to the PDA and immediate surrounding area would be restricted. This may result in a temporary loss of use of the beaches at the cable riser station sites, and disruptions to navigation for recreational boat traffic including whale watching, on a localized and short-term basis.

A variety of management, accounting and payroll, engineering, and construction personnel would be required during construction. It is expected that the Project would generate direct employment for up to

approximately 75 to 100 workers at the peak of construction activity. The residual environmental effects of the Project on employment and economy are predicted to be generally positive because they would result in increased employment opportunities and direct, indirect, and induced revenues from Project-related goods and services as well as generating income and sales tax revenue for governments.

Limited increases in passenger vehicles and heavy trucks transporting workers, materials and equipment are expected during construction; however, traffic volumes are not such that additional traffic from construction activities is unlikely to be of concern. Therefore, in consideration of the short duration and transient nature of the construction, as well as planned mitigation, there would be no noticeable increase in overall traffic volumes or patterns through the LAA, and substantial environmental effects on traffic and the transportation network are not expected.

The Canadian Coast Guard will be informed of submarine cable associated work and Notices to Mariners and/or Shipping may be issued to alert vessel traffic of any changes within the region such as exclusion zones around Project vessels to allow for safe navigation of vessel traffic.

15.3.5.2 Cumulative Environmental Effects during the Construction and Decommissioning Phases

The Project is expected to result in a minor increase in demand in the local labour force and accommodations, and following the suggested mitigation, a minimal residual environmental effect on transportation during construction. The Project labour requirements are modest, such that competition for labour or a decline in the availability of public services are unlikely to cause a significant environmental effect on the socioeconomic environment, even in combination with other projects or activities such as commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential development.

Due to the relatively short construction period, it is expected that most of the workers for land-based activities would be temporary residents of the LAA requiring temporary accommodations, and most or all would not permanently relocate to the area. Workers on the marine vessel laying the marine cable would generally live on the ship rather than in land-based accommodations. The decline in the availability of local accommodations are therefore unlikely to cause a significant environmental effect on the socioeconomic environment, even in combination with other projects or activities such as commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential development.

During construction and decommissioning (if the existing submarine cables are removed), the Project in combination with future commercial fisheries, aquaculture, commercial shipping, and recreational use activities may result in a negative effect to the local economy as these activities may disrupt fishing activities through the temporary presence of navigational hazards and interference with access to fishing grounds. Commercial shipping and recreational use activities may also be disrupted through the temporary presence of navigational hazards. The construction period, however, would be short in duration. In addition, to the extent feasible, efforts would be made to schedule marine-based construction and decommissioning activities to avoid overlap with commercial fishing seasons in the LAA by attempting to complete these Project activities within the commercial fishing off-seasons. Commercial

fisheries, aquaculture, commercial shipping, and recreational use activities in the area are therefore not expected to act cumulatively with the socioeconomic environment during the construction and decommissioning phases of the Project.

If there are commercial and residential development activities that overlap temporally with construction or decommissioning, a positive cumulative effect may result in labour and economy, as there would be increased employment opportunities and direct, indirect, and induced revenues from Project-related goods and services as well as generating income and sales tax revenue for governments.

15.3.5.3 Summary of Cumulative Environmental Effects for Socioeconomic Environment

In summary, while there may be occasional short-term overlapping environmental effects of the Project with those of other projects or activities that have been or would be carried out, given the nature of the Project and the RAA, it is unlikely that those overlapping environmental effects would cause a significant cumulative environmental effect. Therefore, cumulative environmental effects of the Project in combination with other past, present or future activities (including commercial fisheries, aquaculture, commercial shipping, recreational use, and residential and commercial development) on the socioeconomic environment during all phases of the Project are not expected to be substantive, and are rated not significant.

15.3.6 Cumulative Environmental Effects on Commercial, Recreational, and Aboriginal Fisheries

15.3.6.1 Residual Project Environmental Effects Summary

The Project would affect commercial, recreational, and Aboriginal (CRA) fisheries during construction, similar to the marine environment such that a change in marine populations could, in turn, reduce the availability of CRA fishery resources.

Construction and decommissioning activities also have potential to disrupt fishing activities through the temporary presence of navigational hazards and interference with access to fishing grounds. Marine-based Project construction activities (including landfall construction in the intertidal zone) would require the marine PDA to be kept clear of fishing vessels and gear for the duration of these activities at any given point along the marine portions of the PDA. Access to customary CRA fishing grounds along the cable route may therefore be temporarily restricted while Project construction activities are underway.

Establishment of a temporary Project exclusion zone (PEZ) around cable installation activities has potential to disrupt fishing activities by restricting access to customary fishing areas.

Although fishing access would be temporarily excluded within the PEZ during construction, and may also be excluded on an as-needed basis during operation (i.e., for potential repairs) and if the existing submarine cables are removed during decommissioning, the amount of time that any given area would be subject to fishing restrictions is expected to be minimal (i.e., in the order of one to three days), after which it would be expected that the cable laying vessel would have moved along the route to deploy other parts of the cables.

As discussed in Section 15.3.5, operation activities (e.g., emission of EMF) have the potential to affect the marine environment through a change in marine populations, and in turn, reduce the availability of CRA fishery resources. Access to customary CRA fishing grounds along the cable route may be temporarily restricted while maintenance and repair activities are underway.

With respect to employment and expenditure, the CRA Fisheries VC could be positively affected as there may be opportunities for local fishers to be hired during construction, operation and decommissioning phases of the Project (e.g., providing and operating support vessels).

If the existing submarine cables are removed, potential environmental effects pathways for decommissioning the existing cables are generally anticipated to be similar to the environmental effects pathways identified above for the construction phase.

Seasonal aspects may alter the residual environmental effect on CRA fisheries during construction and potentially decommissioning (if the existing cables are removed). Scheduling of Project activities would be coordinated through consultation with local fish harvesters and other stakeholders, and best efforts would be made to schedule activities to reduce interference with fisheries and other activities (although given the overlap in the fishing seasons, complete avoidance of construction or decommissioning activities during a commercial fishing season is unlikely to be achievable). Construction and decommissioning would be scheduled to avoid, when feasible, commercial fishing seasons within the LAA. However, in the event of delays or disruptions to the Project schedule, construction may interact with commercial fishing activities.

With planned mitigation (outlined in Section 11.7.2.2), the residual environmental effects of a change in fishing activities from Project activities or components during each phase of the Project are predicted to be not substantive.

15.3.6.2 Cumulative Environmental Effects during the Construction Phase

During construction, commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are expected to be ongoing and similar to past and present activities in terms of cumulative environmental effects to CRA fisheries, and those environmental effects are encompassed in existing conditions for the marine environment.

Commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are therefore not expected to act cumulatively with CRA fisheries during the construction phase of the Project.

15.3.6.3 Cumulative Environmental Effects during the Operation Phase

The existing submarine cable between Deer Island and Campobello Island would remain in standby service and operate in conjunction with the proposed submarine cable only on an as-needed basis. While both submarine cables are in operation, there would be generation and emission of EMF from both submarine cables. However, as discussed in Section 7.7.2, an average 69 kV cable buried laid on the seafloor has a predicted magnetic field of approximately 8 µT 1 m above the cable and decreases to 1.5 µT at a distance of 4 m and 0.2 µT at 10 m (Normandeau et al. 2011). The magnetic fields from both

the submarine cables would both decrease to near background levels with distance and therefore not act cumulatively with CRA fisheries.

Commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are not expected to act cumulatively with CRA fisheries during operation, as these activities would not generate EMF.

15.3.6.4 Cumulative Environmental Effects during the Decommissioning Phase

During decommissioning, if the existing submarine cables are removed, commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area may act cumulatively with CRA fisheries similar to that during construction. The decommissioning phase, however, would be temporary and short in duration (up to five days, depending on the method of decommissioning) and therefore not expected to act cumulatively with these activities in the RAA. If the existing submarine cables are abandoned, no cumulative environmental effects are expected.

Commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential development activities in the area are expected to be ongoing and similar to past and present activities in terms of changes to marine populations, and those environmental effects are encompassed in existing conditions for the marine environment. Commercial fisheries, aquaculture, commercial shipping, and recreational use activities in the area are therefore not expected to act cumulatively with CRA fisheries during the decommissioning phase of the Project.

15.3.6.5 Summary of Cumulative Environmental Effects for Commercial, Recreational, and Aboriginal Fisheries

Other future projects or activities would be subject to approvals and permits which would determine the acceptability of their environmental effects and prescribe any required mitigation. Cumulative environmental effects of the Project in combination with other past, present or future activities (including commercial fisheries and recreational use) on the marine environment during all phases of the Project are therefore not expected to be substantive, and are rated not significant.

15.3.7 Cumulative Environmental Effects on Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

15.3.7.1 Residual Project Environmental Effects Summary

As discussed in Section 12.5.2, the Wolastoqey traditional land and resource use (TLRU) study identified several traditional activities which may occur along the coast or coastal area of the LAA, including harvesting of seafood, trout, other fish, deer, eggs, berries, ceremonial plants, and medicinal plants and occupancy sites including cabins, tenting and other overnight locations, gathering sites, burial sites, archaeological sites, and sacred sites. The Wolastoqey TLRU also identified Aboriginal fishing activities which have the potential to occur within the marine portion of the LAA (MFC and WNNB 2017). Specific locations were not provided or are considered confidential; however, this assessment conservatively considers current use activities to be occurring in the LAA, regardless of documented use.

Eleven Aboriginal communities and organizations from New Brunswick and Nova Scotia are known to have recently held FSC fishing licences for areas near the PDA. The Wolastoqey TLRU identified 87 communal commercial licences in the Bay of Fundy (MFC and WNNB 2017).

During construction, access to parts of the PDA and LAA would be restricted to Project-related vessels only. This would result in a temporary, short term restriction of use of the area for traditional purposes, including Aboriginal fishing activities as a PEZ is established around Project-related vessels. The amount of time that any given area would be subject to fishing restrictions is expected to be minimal (i.e., in the order of one to three days), after which it would be expected that the cable laying vessel would have moved along the route to deploy other parts of the cables. A temporary PEZ would be in place at some location along the marine cable routes during the entire period of laying the marine cable; however, as the cable laying vessel is mobile and progressively laying cable along the routes, the PEZ would be transient such that a specific location would only be restricted on a temporary basis until the vessel moves along. In addition, the location of the new cables is in close proximity to the existing cables, so it is likely that fishing activities in this area are already limited. To the extent feasible, efforts would be made to schedule marine-based construction activities so as to avoid overlap with commercial fishing seasons in the LAA, of which Aboriginal fishers may participate. The location of the PEZ and associated restrictions would be communicated to fishers, including aboriginal fishers in advance to allow the fishers to plan their activities accordingly.

During operation, there is a risk that fishing gear may become entangled in the submarine cables and Aboriginal fishers may avoid the PDA to prevent this, resulting in a restriction in access. Navigational charts would be updated to include the location of the submarine cables so it can be easily identified by Aboriginal fishers. The area of Project-related restrictions to access during operation is small by comparison, and restrictions to access would be very limited in duration and anticipated only when maintenance activities are taking place a few times over the life of the cable. It is anticipated that current levels of use of land and resources can be accommodated elsewhere either adjacent to the PDA and/or in the region during operation.

During decommissioning, if the existing submarine cables are abandoned in place, there would be no substantive interaction between the Project and the current use of land and resources for traditional purposes by Aboriginal persons. If the existing submarine cables are removed, a short term and temporary restriction in access to land and resources within the LAA would result. The existing cables represent an entanglement hazard to fishing gear. Once decommissioning is complete, if the existing cables are removed, this hazard would be eliminated resulting in improved access to the PDA of the existing cables for use for Aboriginal fishing and other traditional purposes. However, access to this area may continue to be limited by the presence of the new cables, which would be placed in close proximity to the existing cables.

15.3.7.2 Cumulative Environmental Effects during the Construction, Operation, and Decommissioning Phases

The residual environmental effects of the Project on current use of land and resources for traditional purposes by Aboriginal persons are expected to be low given the size, nature and location of the PDA. While there is no doubt that modern development in general and past and present activities in the RAA

have or are affecting the current use of land and resources for traditional purposes by Aboriginal persons, given the relatively small footprint of the Project and its location (including the fact that land and resources are widely available throughout the region and there is comparatively little current use activity expected to be affected on land), it is not anticipated that the environmental effects of the Project are of an extent to be measurable in the context of cumulative environmental effects with other projects or activities.

15.3.7.3 Summary Cumulative Environmental Effects for Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

It is anticipated that any other future projects or activities that might be proposed in the future would be subject to environmental review and their environmental effects on the natural resources would be taken into account, similar to this Project. Therefore, cumulative environmental effects of the Project in combination with other past, present or future projects and activities (including commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential developments) on current use of land and resources for traditional purposes by Aboriginal persons during all phases of the Project are not anticipated to be substantive, and are rated not significant.

15.4 SUMMARY AND DETERMINATION OF SIGNIFICANCE

Past commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential development have affected the existing landscape; however, those alterations were considered in, and encompassed within, the baseline conditions used to assess the residual environmental effects of the Project.

The Project would result in some environmental effects on VCs that may potentially overlap with similar environmental effects on those VCs from other past, present, or reasonably foreseeable projects or activities in the area. However, in all cases, these cumulative environmental effects are similar to the residual Project environmental effects presented in the EIA Registration, though in most cases having limited temporal and spatial overlap. Residual environmental effects from Project activities are predicted to be not significant. It is understood that other projects or activities in the area would be required to reduce potential environmental effects through compliance with government standards and permit stipulations, further reducing the potential for cumulative environmental effects. No additional mitigation is recommended. Cumulative environmental effects during all phases on all affected VCs are not expected to be substantive.

Therefore, given the limited residual environmental effects of the Project and with the application of planned Project mitigation, cumulative environmental effects of the Project in combination with other activities that have been or would be carried out (including commercial fisheries, aquaculture, commercial shipping, recreational use, and commercial and residential development) during all phases of the Project on all affected VCs are rated not significant, with a high level of confidence.