8.0 NOVA SCOTIA

8.1 SPECIES OF CONSERVATION INTEREST

The SOCI VEC for Nova Scotia refers to those wildlife species that live at least part of their life cycle in Nova Scotia, and that have been identified by federal or provincial laws and regulations as being “Endangered,” “Threatened,” “Vulnerable” or of “Special Concern”.

SOCI were collectively selected as a VEC because of the specific regulatory requirements of *SARA* and provincial endangered species laws and regulations. SOCI require special attention during the environmental assessment process as their populations may be more sensitive to anthropogenic stressors than secure or non-threatened species and they often serve as important indicators of ecosystem health and regional biodiversity. Non-SOCI marine and coastal species are assessed in other VECs, including the Commercial Fisheries VEC (Section 7.2) and Marine Environment VEC (Section 7.3). SOCI are also assessed in the island of Newfoundland and Cabot Strait SOCI VECs (Sections 6.2 and 7.1, respectively).

8.1.1 SCOPE OF ASSESSMENT

8.1.1.1 Regulatory Setting

Both federal and provincial legislation protect SOCI. *SARA* and the Nova Scotia *Endangered Species Act* (NS *ESA*) generally protect species listed as being extirpated, endangered or a threatened as well as the residences and critical habitats of those species.

At the federal level, *SARA* seeks “to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.” A “wildlife species” under *SARA* is “a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and (*a*) is native to Canada; or (*b*) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.”

Key provisions protecting SOCI under *SARA* include:

- S. 32(1): “No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.”
- S. 32(2): “No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual.”

- S. 33: “No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.”
- For listed wildlife species that are not an aquatic species or a species of birds that are migratory birds protected by the *Migratory Birds Convention Act*, 1994, ss. 32 and 33 only apply to federal lands unless an order is made.
- A recovery plan and an action plan must be prepared for a wildlife species listed as an extirpated species, an endangered species or a threatened species. [ss. 37, 47]
- S. 58: “No person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species — or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada — if (a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada; (b) the listed species is an aquatic species; or (c) the listed species is a species of migratory birds protected by the *Migratory Birds Convention Act*, 1994.”

  “Critical habitat” in *SARA* means “means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species.”
- Section 61 provides for the protection of the critical habitat of listed endangered species and threatened species not located on federal land specified by an order.
- Protection of wildlife species not listed under *SARA* but listed by a provincial or territorial minister and their habitat on federal land is provided under ss. 36 and s. 60.
- A management plan must be prepared for a wildlife species listed as a species of special concern and its habitat. [s. 65]

A person may, however, be authorized by an agreement or a permit under s. 73 (or under another Act of Parliament or provincial legislation) to engage in an activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals provided that certain conditions are satisfied.

Ministerial notification is required under s. 79 if a project is likely to affect a listed wildlife species or its critical habitat. The person required to notify the minister must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.

Migratory birds in general, including SOCI, are protected federally under the *MBCA*, which is administered by EC. The MBCA and Regulations provide protection to all birds listed in the CWS Occasional Paper No. 1, “Birds Protected in Canada under the *Migratory Birds Convention Act*”. The Act and associated Regulations state that no person may disturb, destroy,

or take/have in their possession a migratory bird (alive or dead), or its nest or eggs, except under authority of a permit. Migratory birds protected by the Act generally include all seabirds, except cormorants and pelicans, all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles) (EC 2012d).

Aquatic organisms in general, including SOCI, are protected federally under the *Fisheries Act*. The *Fisheries Act* and Regulations provide protection to all aquatic organisms in habitats defined as "fish habitat", which includes spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.

Similar protection exists under the NS *ESA*. Key provisions protecting SOCI under the NS *ESA* include:

- S. 13(1): "No person shall:

(a) kill, injure, possess, disturb, take or interfere with or attempt to kill, injure, possess, disturb, take or interfere with an endangered or threatened species or any part or product thereof;

(b) possess for sale, offer for sale, sell, buy, trade or barter an endangered or threatened species or any part or product thereof;

(c) destroy, disturb or interfere with or attempt to destroy, disturb or interfere with the specific dwelling place or area occupied or habitually occupied by one or more individuals or populations of an endangered or threatened species, including the nest, nest shelter, hibernaculum or den of an endangered or threatened species;

(d) contravene any regulation made with respect to a core habitat; or

(e) contravene an order made pursuant to Section 18."

> "Core habitat" means "specific areas of habitat essential for the long-term survival and recovery of endangered or threatened species and that are designated as core habitat pursuant to Section 16 or identified in an order made pursuant to Section 18."

- A recovery plan for species listed as endangered or threatened must be prepared. [s. 15(1)]
- A management plan for species listed as vulnerable must be prepared. [s. 15(10)]
- S. 18(1): "Where an endangered or threatened species is listed on a precautionary basis pursuant to Section 11, the Minister may make such order as, in the opinion of the Minister, with the advice of the Group, is necessary to control, restrict or prohibit activities that may adversely affect the endangered or threatened species, including activities that may adversely affect the core habitat of the endangered or threatened species."

The conservation and recovery of species assessed and listed under the NS *ESA* is coordinated by NSDNR (Wildlife Division).

8.1.1.2 Selection of Environmental Effects and Measurable Parameters

The environmental assessment of SOCI is focused on changes that would directly or indirectly affect a species at the population level. This environmental effect was chosen based on regulatory requirements as well as public concern regarding the at-risk status of these species.

The Project has the potential to affect the SOCI through changes in their abundance, as well as the quantity and quality of their habitat. Such changes may contribute to the loss of SOCI populations and the corresponding loss in regional biodiversity. The specific concerns are habitat loss or degradation and/or avoidance of habitat by SOCI, as well as loss of individuals, which may result in population declines.

The measurable parameters used for the assessment of the environmental effects presented above, and the rationale for their selection, are provided in Table 8.1.1. The selection was based on professional judgment of the Study Team. The measurable parameters have a clear unit of measurement and are important to SOCI populations.

Table 8.1.1 Measurable Parameters for SOCI (NS)

Environmental Effect	Measurable Parameter	Rationale for Selection of the Measurable Parameter
Change in SOCI Populations	Change in Habitat	• Interactions between the Project activities and habitat used by SOCI could affect SOCI populations where they overlap.
	Change in Mortality Risk	• An increase in mortality could have an effect on the sustainability of endangered, threatened, and special concern (vulnerable) populations of SOCI.

8.1.1.3 Temporal and Spatial Boundaries

The temporal boundaries for the assessment of the potential environmental effects of the Project on SOCI include the periods of construction, planned to occur between 2013 and 2016, and operation and maintenance.

Project-related environmental effects on SOCI will be greatest during construction, when the majority of disturbance related to ground work occurs. Operation and maintenance would have the least potential to create adverse environmental effects on SOCI. Construction of the Project will be carried out over approximately three years. Operation and maintenance would begin following the completion of construction and will continue for the life of the project.

The spatial boundaries for the environmental effects assessment of SOCI are defined below.

The SOCI VEC Study Area is a 500 m-wide corridor from Point Aconi to Woodbine (Figure 8.1.1).

The assessment of cumulative effects for SOCI includes the Bras d'Or Lowlands, Cape Breton Hills, and Cape Breton Coastal Ecodistricts, as defined by Neily *et al.* (2003).

8.1.1.4 Threshold for Determining the Significance of Residual Environmental Effects

A **significant adverse residual environmental effect** on SOCI is defined as a Project-related environmental effect that meets any of the following criteria:

- One that results in a non-permitted contravention of any of the prohibitions stated in Sections 32–36, 58 or 33 of *SARA* or Section 13 of the NS *ESA*. These prohibitions stipulate that it is an offence to kill, harm, injure, disturb, interfere with, capture, possess, buy, sell, offer for sale, barter, possess, trade, or take any individual or part of an individual belonging to a species that is designated as "Endangered," "Threatened," or "Extirpated." Similarly, it is an offence to attempt the actions listed above, or to direct another to do them. It is also illegal to damage, disturb, or destroy the residence of an individual of an "Endangered" or "Threatened" species, or of an "Extirpated" species if reintroduction is recommended.

- One that is not in compliance with the objectives of recovery or management plans created under *SARA* and NS *ESA* that are in place at the time of relevant Project Activities.

- One that alters the habitat of the SOCI within the Project boundaries, physically, biologically, in quality or extent, in such a way as to cause a change or decline in the distribution or abundance of a SOCI population that is dependent upon that habitat, such that the likelihood of the longterm survival of these populations in Nova Scotia is substantially reduced as a result.

- One that results in the direct mortality of individuals such that the likelihood of the longterm survival of these populations in Nova Scotia is substantially reduced as a result.

8.1.2 BASELINE CONDITIONS

A number of protected and sensitive areas have been identified in the general vicinity of the Study Area in Cape Breton. These areas can provide important habitat for wildlife species including SOCI as noted below. The locations of protected and sensitive areas with ecological significance in Cape Breton are illustrated in Figure 8.1.1.

Table 8.1.2 lists those species considered within this VEC, as well as their designation under *SARA,* COSEWIC, and NS *ESA.*

Table 8.1.2 SOCI with Potential to Occur in the Study Area (NS)

Scientific Name	Common Name	Status		
		SARA[a]	COSEWIC	NS *ESA*
Mammals				
Canada lynx	*Lynx canadensis*	Not At Risk	Not At Risk	Endangered
American marten	*Martes americana*	No Status	No Status	Endangered
Little brown myotis	*Myotis lucifugus*	No Status	Endangered	No Status
Northern myotis	*Myotis septentrionalis*	No Status	Endangered	No Status

Table 8.1.2 SOCI with Potential to Occur in the Study Area (NS)

Scientific Name	Common Name	Status		
		SARA[a]	COSEWIC	NS *ESA*
Birds				
Harlequin Duck (Eastern pop.)	*Histrionicus histrionicus pop. 1*	Special Concern	Special Concern	Endangered
Barrow's Goldeneye (Eastern pop.)	*Bucephala islandica (Eastern pop.)*	Special Concern	Special Concern	No Status
Peregrine Falcon *anatum/tundrius* subspecies	*Falco peregrinus anatum/tundrius*	Special Concern	Special Concern	Vulnerable (specifically the former anatum subspecies)
Piping Plover *melodus* subspecies	*Charadrius melodus* ssp. *melodus*	Endangered	Endangered	Endangered
Red Knot *rufa* subspecies	*Calidris canutus* ssp. *rufa*	Endangered	Endangered	Endangered
Short-eared Owl	*Asio flammeus*	Special Concern,	Special Concern	No Status
Common Nighthawk	*Chordeiles minor*	Threatened	Threatened	Threatened
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	Endangered
Olive-sided Flycatcher	*Contopus cooperi*	Threatened	Threatened	No Status
Barn Swallow	*Hirundo rustica*	No Status	Threatened	No Status
Bicknell's Thrush	*Catharus bicknelli*	Threatened	Threatened	Vulnerable
Canada Warbler	*Wilsonia canadensis*	Threatened	Threatened	No Status
Bobolink	*Dolichonyx oryzivorus*	No Status	Threatened	No Status
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern	No Status
Terrestrial Reptiles				
Wood turtle	*Glyptemys insculpta*	Threatened	Threatened	Vulnerable
Diadromous Fishes				
American eel (catadromous)	*Anguilla rostrata*	No Status	Threatened	No Status
Atlantic Salmon (Eastern Cape Breton pop.)	*Salmo salar*	No Status	Threatened	No Status
Vascular Plants				
Prototype quillwort	*Isoetes prototypus*	Special Concern	Special Concern	Vulnerable
New Jersey rush	*Juncus caesariensis*	Special Concern	Special Concern	Vulnerable
Lichens				
Boreal felt lichen (Atlantic pop.)	*Erioderma pedicellatum (Atlantic pop.)*	Endangered	Endangered	Endangered
Frosted glass-whiskers (NS pop.)	*Sclerophora peronella (*NS *pop.)*	Special Concern	Special Concern	No Status
Molluscs				
Yellow lampmussel	*Lampsilis cariosa*	Special Concern	Special Concern	Threatened
Insects				
Monarch	*Danaus plexippus*	Special Concern	Special Concern	No Status

[a]*SARA* designations are within Schedule 1 unless otherwise noted

8.1.2.1 SOCI Information Sources

For each of SOCI, status under *SARA*, NS *ESA*, and COSEWIC, was determined through a review of the following sources:

- SAR Public Registry website (http://www.*SARA*registry.gc.ca/default_e.cfm);
- the NS SAR website (http://www.gov.ns.ca/natr/wildlife/biodiversity/species-list.asp); and
- the most recent COSEWIC status reports.

Current provincial S-ranks (sub-national, or provincial, rarity or conservation status ranks) and General Status ranks (national and provincial rankings that summarize current state and known trends in population distribution and size, and individual or habitat threats) were determined through a review of the most recently released information from the Atlantic Canada Conservation Data Centre (AC CDC) and CESCC, respectively (AC CDC 2011, CESCC 2011).

Primary habitat for each species, defined broadly as habitat that provides the main requirements for the survival of a species, was determined from known habitat associations and information from COSEWIC status reports, COSEWIC management plans, and other literature. For each species, this information was then related to habitat types within the Study Area, as delineated in the ELC developed for the Project. Species are often associated with habitats that are more specific than the described ELC types; in these cases, primary habitat was listed as the ELC type(s) that contains the primary habitat for the species, with additional parameters stated when necessary.

Table 8.1.3 lists ELC types by area and % of total coverage in the Study Area in Cape Breton.

Table 8.1.3 ELC Types by Area and % of Total Coverage Within the Study Area (NS)

ELC Types	Area (ha) within the Study Area	Relative % of the Study Area
Coniferous Forest	1126.6	24.9
Coniferous Scrub	142.8	3.2
Deciduous Forest	1730.4	38.3
Deciduous Scrub	0.6	0.0
Mixed Wood Forest	55.1	1.2
Cutover	154.3	3.4
Ericaceous/Coniferous Scrub Complex	115.3	2.6
Wetland: Coniferous Forest	163.9	3.6
Wetland: Ericaceous/ Coniferous Scrub	102.8	2.3
Wetland: Deciduous Forest	211.0	4.7
Wetland: Deciduous Scrub	0.04	0.0
Wetland: Mixed Wood Forested	9.4	0.2
Wetland: Bryoid/ Graminoid	16.0	0.4

Table 8.1.3 ELC Types by Area and % of Total Coverage Within the Study Area (NS)

ELC Types	Area (ha) within the Study Area	Relative % of the Study Area
Wetland: Graminoid/Herbaceous	24.0	0.5
Wetland: Unvegetated Peat or Bog Pool	1.9	0.0
Water	56.4	1.2
Exposed Rock/Unvegetated Anthropogenic	123.1	2.7
Vegetated Anthropogenic	352.3	7.8
Imagery Cloud and Shadow (hopefully temporary)	130.9	2.9
Total	**4516.8 ha**	**100%**

ENL commissioned several field-based studies to gain more knowledge on the distribution and abundance of wildlife species within the Study Area in Cape Breton. These field studies included coastal avifauna migration surveys, winter wildlife track surveys, and avifauna breeding surveys.

Additional information on the distribution of SOCI in Canada, and specifically within Cape Breton, was attained from COSEWIC status reports, AC CDC reports, and scientific literature. For bird SOCI, information from the Maritimes Breeding Bird Atlas (MBBA) was also used. The MBBA is a program that monitors bird populations in the Maritime Provinces, and is composed of data collected by skilled volunteers in defined geographical “squares.”

8.1.2.2 Protected and Sensitive Areas Near the Project

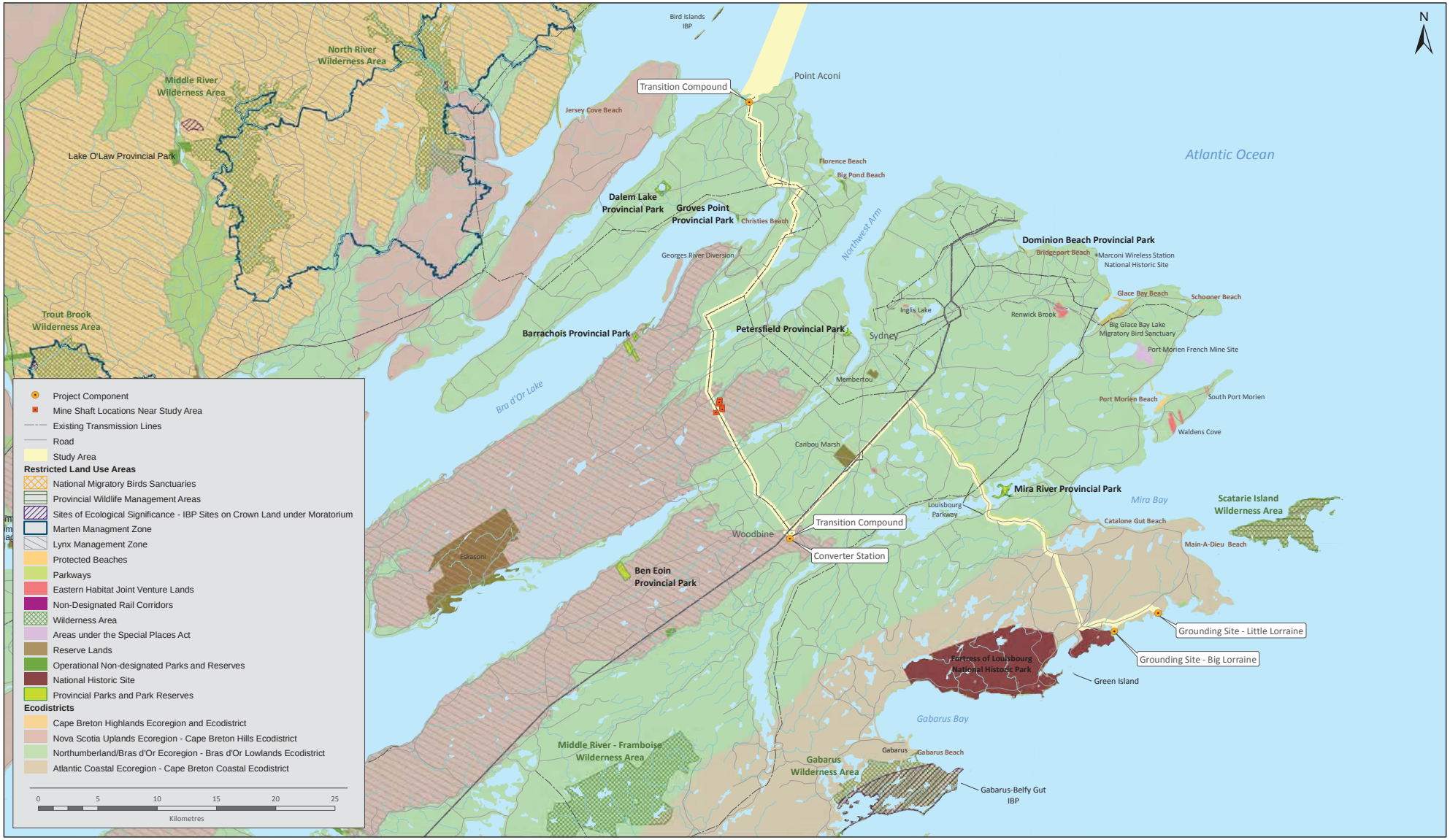
A number of protected and sensitive areas have been identified in the general vicinity of the Study Area in Cape Breton. The locations of protected and sensitive areas with ecological significance in Cape Breton are illustrated in Figure 8.1.1.

Federal Protected Areas

Of the Federal Protected Areas in Nova Scotia including National Parks, National Historic Sites, and National Marine Conservation Areas, managed by Parks Canada; and NWAs, Marine Wildlife Areas, and MBSs, managed by EC; and Marine Protected Areas, managed by DFO, the Fortress of Louisbourg National Historic Site is closest to the Project, approximately four kilometres from the southern end of the Study Area.

Provincial Protected Areas

There are five different provincial protected area designations in Nova Scotia. These include Provincial Parks and Reserves, managed by the Parks and Recreation Division of NSDNR; and Wilderness Areas, Nature Reserves, and Heritage Rivers, managed by the Protected Areas Branch of Nova Scotia Environment. Additional land is protected privately, through Land Trusts, and Conservation Easement Lands. No privately protected lands are located near the Study Area.



Emera Newfoundland & Labrador

Coordinate System: UTM NAD 83 Zone 21
Scale: 1:300,951
Date: 18/12/2012

Data Sources: Geobase - Road Network; Geogratis - National Atlas; Government of Nova Scotia

Protected and Sensitive Areas
Cape Breton

FIGURE 8.1.1

ENL0060

Provincial Parks and Reserves

There are 128 areas that are considered Provincial Parks and Provincial Park Reserves in Nova Scotia, 28 of which are in Cape Breton. Provincial Parks and Reserves in Nova Scotia are legislated by the *Provincial Parks Act*, and range in size from small lookouts and picnic areas to larger areas with extensive natural features, hiking trails, and camping facilities. These areas are protected by the *Parks Act*, the *Trails Act*, and the *Beaches Act*. Groves Point Provincial Park (Figure 8.1.1) is located approximately 4 km west of the Study Area, in Groves Point on the north shore of Bras d'Or Lake. Barrachois Provincial Park (Figure 8.1.1) is located approximately 4.5 km west of the Study Area in Barrachois on the south shore of Bras d'Or Lake. Mira River Provincial Park is located approximately 1.5 km from the Study Area. No other Provincial Parks are within 10 km of the Study Area.

Wilderness Areas, Nature Reserves, and Heritage Rivers

Wilderness Areas are natural areas are considered to represent important areas of natural landscapes and biological diversity in Nova Scotia. They are designated under, and protected by, the *Wilderness Areas Protection Act*, which prohibits many activities, such as commercial resource development. There are currently 37 Wilderness Areas in Nova Scotia, the closest to the Project Study Area is Scatarie Island Wilderness Area, which is approximately 10 km away.

Nature Reserves are smaller than Wilderness Areas, and are chosen to protect special and representative species, ecosystems, and other natural features and processes. There are currently 21 Nature Reserves in Nova Scotia, none of which are near the Study Area.

Heritage Rivers are part of the Canadian Heritage Rivers System, the objective of which is to protect examples of Canada's river heritage. There are two Heritage Rivers in Nova Scotia, neither of which is near the Study Area.

Important Bird Areas

The IBA Programme is an international bird conservation program established by Bird Life International that aims to identify important bird habitat, and monitor and protect these areas. In Canada, Bird Studies Canada and Nature Canada are IBA Programme co-partners.

Although there are a number of IBAs in Cape Breton, only three are near the Study Area. The Bird Islands IBA is approximately 6 km north-northwest of the Study Area at Point Aconi, in the Cabot Strait. This IBA includes two narrow islands (Hertford Island and Ciboux Island) with steep, high cliffs that provide habitat for a colony of more than 500 nesting pairs of Great Cormorants, the largest colony in North America. The Central Cape Breton Highlands IBA is located on the mainland near the Bird Islands IBA, approximately 6 km west-northwest of the Study Area at Point Aconi. This IBA contains natural coniferous forest and wetlands and provides habitat for up to 4% of the global population of Bicknell's Thrush. The Harbour Rocks IBA, a small, rocky island near Louisbourg, NS, is located on the Atlantic coast of Cape Breton. This IBA provides important nesting habitat for Great Cormorants (IBA Canada 2010).

Wetlands, Watercourses, and Beaches

Wetlands are biologically important habitats that are protected under the *Environment Act* and the Nova Scotia Wetland Conservation Policy, the latter of which promotes the principle of no net loss of wetlands within the Province. A wetland is defined as an area that "either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water; and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions." A permit is required in Nova Scotia to alter a wetland greater than 100 m^2 in size. Some wetlands are considered "Wetlands of Special Significance", including (but not limited to) salt marshes, wetlands within, or partially within, Ramsar sites (internationally identified wetlands of importance) or provincially protected areas, and wetlands known to provide habitat for species designated under *SARA* or the NS *ESA.*

8.1.2.3 ELC and SOCI Habitat Relationships

A summary of the correlation between ELC habitat types and known habitat associations for SOCI within the Study Area is provided in Table 8.1.4. Although included in the VEC, Barrow's Goldeneye were not assessed and are not included in Table 8.1.4. Barrow's Goldeneye is a waterfowl species that spends the summer months in the northern Labrador and Québec region, and the majority of the population winters in the St. Lawrence Estuary. Although it is associated with Nova Scotia, it is highly unlikely that the species would be found within the Study Area.

Table 8.1.4 Primary ELC Types for SOCI Likely to Occur Within the Study Area (NS)

EOSD Land Cover Class	Canada Lynx	American Marten	Little Brown Myotis and Northern Myotis	Harle-quin Duck	Barrow's Goldeneye	Pere-grine Falcon	Piping Plover*melo-dus*ssp	Red Knot*rufa*ssp	Short-eared Owl	Common Night-hawk	Chimney Swift	Olive-sided Fly-catcher	Barn Swallow	Bicknell's Thrush	Canada Warbler	Bobolink	Rusty Blackbird	Wood Turtle	American Eel	Prototype Quillwort	New Jersey Rush	Boreal Felt Lichen	Frosted Glass-whiskers	Yellow Lamp-mussel	Monarch
Coniferous Forest	✓	✓	✓								✓	✓		✓	✓			✓				✓			
Coniferous Scrub	✓													✓				✓							
Deciduous Forest			✓								✓	✓			✓			✓					✓		
Deciduous Scrub																		✓							✓
Mixed Wood Forest	✓	✓	✓								✓	✓			✓			✓					✓		
Cutover										✓		✓													
Ericaceous/ Coniferous Scrub Complex	✓													✓				✓							
Wetland: Coniferous Forest	✓														✓		✓								
Wetland: Ericaceous/ Coniferous Scrub	✓																✓	✓							
Wetland: Deciduous Forest															✓										
Wetland: Deciduous Scrub												✓			✓		✓	✓							✓
Wetland: Mixed Wood Forested															✓		✓								
Wetland: Bryoid/ Graminoid									✓	✓		✓						✓			✓				✓
Wetland: Graminoid/ Herbaceous									✓	✓		✓						✓			✓				✓
Wetland: Unvegetated Peat or Bog Pool									✓	✓		✓						✓			✓				
Water				✓	✓													✓	✓	✓				✓	
Exposed Rock/ Unvegetated Anthropogenic			✓	✓	✓	✓	✓	✓		✓	✓		✓					✓							✓
Vegetated Anthropogenic			✓						✓	✓	✓		✓			✓		✓							✓

Given the relatively coarse resolution at which ELC types are delineated, it is not surprising there are SOCI potentially occurring in each of the identified habitat types. The classification of habitat types in the ELC does not always delineate the more specific habitat types that SOCI may require. The preferred habitat for these species may be a subset of the ELC types, (*i.e.*, the ELC types represent the potential for the occurrence of SOCI). For example, American marten prefer mature forest with a coniferous tree component, relatively closed canopy, and structural elements, such as coarse woody debris. The ELC classification does not discriminate forest age or height, so coniferous forest and mixed wood forest are both included as potential primary habitat for American marten, even though these categories likely include young and/or recently disturbed stands that are not ideal for this species. In addition, this species is only known to occur in specific areas in Cape Breton, so only relevant ELC types within or near those known areas are likely to support this species.

8.1.3 POTENTIAL PROJECT-VEC INTERACTIONS AND ENVIRONMENTAL EFFECTS

8.1.3.1 Potential Project-VEC Interactions

Table 8.1.5 ranks for each Project activity the potential effects on NS SOCI as 0, 1, or 2 based on an assessment of the level of risk at the population level.

Table 8.1.5 Potential Project Environmental Effects to SOCI (NS)

Project Activities and Physical Works	Potential Environmental Effect
	Change in SOCI populations
Construction	
Site Access and Site Preparation	2
Transmission and Grounding Line Infrastructure	2
Converter Stations	2
Grounding Facility	2
Operation	
Overland Power Transmission	1
Power Conversion	1
Maintenance	
Regular Inspection	1
Repair to Infrastructure	1
Vegetation Management	2
KEY 0 = No interaction 1 = Interaction occurs; however, based on past experience and professional judgment, the resulting effect can be managed to acceptable levels through standard operating practices and/or through the application of best management or codified practices. No further assessment is warranted. 2 = Interaction occurs, and resulting effect may exceed acceptable levels without implementation of specified mitigation. Further assessment is warranted.	

No interactions with Project activities or physical works have been ranked as 0.

Potential interactions relating to power transmission, conversion, and infrastructure maintenance were ranked as 1.

Avifauna mortality can occur as a result of a collision with overhead transmission structures or lines, or electrocution. Migratory flight heights are usually higher than 50 m and therefore migrating species are not prone to collision during flight. Diurnal migrants (*i.e.*, waterfowl, waterbirds, raptors) tend to vary flight heights but unless there are distinct features to draw them in (*i.e.*, wetlands, lakes) for staging purposes, they are likely flying higher than transmission line heights. Local movement of birds between habitats (*e.g.*, wetlands to uplands) are expected to be below power lines as separation distance and bird flight behaviour would typically result in low flight heights and in close association with the height of trees being flown to, or from. The RoW naturally provides a vertical and horizontal separation between the transmission lines and trees/perches which allows for easier detection and avoidance of the lines. Electrocution can only occur if a bird touches two phase conductors, or a conductor and an energized device simultaneously. Based on conceptual design the clearance between two phase conductors for AC and DC lines are approximately 6.5 m and 9 m respectively. The clearance between the grounded and energized equipment on the proposed transmission lines is approximately 3 m. These clearance distances are larger than the maximum wing span of birds found within the study area (maximum wing spans for Bald Eagle and Osprey are approximately 2.5 m and 2 m, respectively) therefore the risk of electrocution is considered low and with respect to making contact with two phase conductors extremely rare. Electrocutions are most likely to occur on lower voltage distribution lines (4 to 34.5 kV, in which the spacing between conductors may be small enough to be bridged by birds (APLIC and USFWS 2005). In addition, avian avoidance devices may be installed to minimize bird collisions with Project infrastructure in identified high risk areas.

The potential environmental effects of these aspects of the Project are limited to accidental events, or indirect effects such as noise. Infrastructure maintenance will occur in habitat that has already been altered through Project activities associated with construction, and therefore potential environmental effects are limited to accidental events or indirect effects such as increased human presence and access. The potential effects of these activities will be mitigated by the use of standard best management practices, such as those contained in the document "Environmental Protection Procedures for Transmission and Distribution Facilities" (Emera 2009), and as described in Section 2.8, or would be low enough in magnitude so as to not result in a significant adverse environmental effect on SOCI populations.

In consideration of the nature of the interactions and the planned implementation of proven mitigation, the potential environmental effects on SOCI from all Project activities and physical works that were ranked as 1 are rated not significant, and are not considered further in the assessment.

8.1.3.2 Assessment of Potential Environmental Effects

All construction activities and vegetation management were ranked as 2, and will thus be considered in more detail in this EA.

Construction

Project activities associated with construction can potentially have an effect on SOCI populations through changes in habitat. Partial vegetation removal will occur through clearing activities, and complete vegetation removal will occur through site preparation in areas where tower assembly and installation will occur. Vegetation removal will result in a direct change in habitat within the Study Area, but will also result in indirect changes to abiotic habitat features, such as increased light availability and changes in temperature and humidity in adjacent areas.

Change in habitat may result in adverse effects on SOCI. For example, some activities occurring within the Study Area may have potential to directly interact with bat hibernacula, if present, and may also have the potential to result in the loss of breeding habitat for several bird SOCI. Construction activities may also result in a change in habitat through fragmentation, (*i.e.*, discontinuity in preferred habitat), leading to the reduction or loss of freedom of movement between resulting patches. Change in habitat through fragmentation may be substantial for species that are found in the vicinity of the Study Area and currently move through and within the Study Area to access preferred habitat. The promotion of edge-influenced habitat (*i.e.*, habitats adjacent to openings) by the Project may result in increased predation on birds and small mammals, but also has potential benefits related to food availability. Generally, linear developments such as transmission lines contribute to habitat fragmentation due to the large amount of edge that they produce relative to the area disturbed. However, the Project will contribute less to habitat fragmentation than in previously undisturbed landscapes, as the entire route follows existing linear developments.

Small mammal and herpetile populations which have limited dispersal capabilities are particularly susceptible to habitat fragmentation. Remnant populations that are isolated in small fragments are more prone to local extirpation. Additionally, although fragments may be large enough to support a population, they may not be large enough to provide rebuild the population should it be heavily affected by disease or predators. Isolation of the fragment can also impair the immigration of new animals into an area where a local population has been extirpated. Impaired immigration can also adversely affect populations by restricting gene flow between populations leading to inbreeding.

Although habitat fragmentation is typically of greater concern for species with limited dispersal ability such as small mammals and herpetiles, it can also affect highly mobile animals such as birds. During the breeding season some species may be reluctant to cross clearings, causing populations to be isolated in resultant habitat fragments. Studies by CWS of bird use of forest patches in agricultural areas in Québec found that bird movement between patches decreased with increasing distance between patches (CWS Undated). The authors determined that the influence of edge effects extended as far as 300 m from the forest edge. It was also observed

that approximately 98% of the movements between habitat patches were concentrated in gaps less than 200 m, and some species traveled up to three times as far to avoid a gap. In summary, physical isolation of a population combined with the edge effects may eliminate species in fragmented habitats.

Site preparation can also result in avoidance of habitat as a result of sensory disturbance to wildlife in adjacent undisturbed habitats. Wildlife may vacate areas in close proximity to the source of disturbance or important functions such as foraging, breeding or rearing of offspring may be impaired by the activities. These effects can extend several hundred metres into the surrounding, otherwise undisturbed habitat. For example, terrestrial bird monitoring studies conducted during the construction phase of the Confederation Bridge (Jacques Whitford 1997b) revealed that bird abundance was reduced by up to 35% within 200 m of a road construction site while the number of birds exhibiting evidence of successful breeding activity was reduced by up to 56%. This study noted that although the overall avifaunal community was not substantially changed as a result of exposure to sensory disturbance, certain species were more sensitive to disturbance than others.

Project activities associated with site preparation have potential to affect SOCI populations through direct mortality of individuals. Mortality of non-mobile SOCI (such as plants, lichens or very immature mammals or birds) may result from construction, either directly on individuals that occur within areas cleared for the Project through ground disturbance, or indirectly on individuals that are found adjacent to cleared areas, as removal of vegetation may change abiotic and biotic habitat features (*e.g.,* light availability) within the Study Area. Furthermore, animals that are displaced by loss of habitat may eventually succumb if they are unable to establish new home ranges due to a lack of suitable or unoccupied habitat.

Erosion and increased sedimentation in watercourses and wetlands resulting from vegetation removal associated with site preparation clearing activities also has the potential to result in a change in mortality risk for freshwater SOCI within the Study Area.

Clearing activities associated with site preparation will also allow increased access for humans, which has the potential to result in a change in mortality of SOCI through increased activities such as hunting, trapping, snaring, and fishing, and also by humans acting as a vector for disease (*e.g.*, transferring white-nosed fungus from an infected bat hibernaculum to a previously uninfected bat hibernaculum). Although NSDNR is currently restricting access to bat hibernacula within the province to help limit the spread of white nose syndrome, the potential for increased access to potential hibernacula presents a potential adverse effect due to limitations in enforcement.

Vegetation removal associated with clearing activities has the potential to result in a change in mortality risk through increased predation. This may result from aerial predators frequenting areas from which overhead cover has been removed, or from terrestrial predators taking advantage of the removal of trees and other structural elements used by prey for escape. Additionally, food waste that is improperly disposed of onsite can lead to wildlife mortality. The

availability of food scraps can attract generalist predators and the presence of elevated numbers of these predators can result in increased predation on wildlife in the area. Attraction of predators and scavengers to the site can also result in the habituation of these species to the presence of humans on the site and some individuals may have to be killed to prevent damage or potential injuries to workers. Animals that are trapped and relocated may also die if there is no available habitat or insufficient resources in the area where they are released.

Tower assembly and installation is not expected to result in a further change in habitat for SOCI, as the area would have previously been cleared and habitat previously changed through site preparation activities. There may be some opportunity to avoid concentrations of rare plants and their habitats through micrositing of tower foundations and associated ground disturbance during final Project layout. For example, wetlands and other habitats supporting high concentrations of rare plants will be avoided where feasible.

Operation and Maintenance

The presence of new towers and conductors has the potential to result in a change in mortality risk for some aerial species (*i.e.*, bats and birds) through direct collision.

As the Study Area parallels an existing transmission line or other corridors in Cape Breton, change in mortality associated with direct collision with physical works will not represent a new potential environmental effect in the area, but it could lead to an incremental increase in mortality due to a simple increase in the number of structures and wires with which to collide.

In general, the primary alteration to vegetation and associated habitats (*e.g.*, fragmentation) occurs during initial clearing conducted during site preparation. However, areas could be used as habitat by some species (such as breeding birds) once vegetation becomes established in the corridor following the initial clearing; therefore vegetation management during Project operations and maintenance could affect SOCI within those areas on an ongoing basis.

In particular vegetation management, much like initial clearing, has potential to affect SOCI populations through a change in risk of mortality directly due to cutting activities and/or indirectly through displacement from preferred habitats.

Vegetation management, specifically the use of herbicides, also has the potential to result in a change in mortality risk for SOCI through direct mortality (particularly plants, lichens, and freshwater fishes).

Increased access resulting from Project activities may also result in an increased risk of mortality to SOCI from increased human predation and ATV use.

8.1.4 MITIGATION OF PROJECT ENVIRONMENTAL EFFECTS

The mitigation measures that will be used (wherever technically and economically feasible) to reduce environmental effects of the Project on SOCI in Cape Breton, are listed below.

- Detailed mapping, through the application of the ELC will be produced to identify the distribution and known locations of SOCI and associated habitat such that they can be considered during detailed design for avoidance during micrositing of Project routing, transmission tower and foundation placement, and timing of Project activities, in order to avoid SOCI habitat, including mature and interior forest where feasible.

- Reference will be made to the distribution of SOCI habitat when considering Project routing, transmission tower and foundation placement, and timing of Project activities. For example, various types of forested habitat have been identified as SOCI habitat for a number of SOCI that potentially exist within the Study Area—as a result, ENL will work to avoid identified SOCI habitat within the proposed alignment.

- Tree clearing activities will be executed in a manner that complies with the *MBCA* and *SARA*, specifically, based on the prohibition of incidental take:

    - Primary mitigation will be through project planning and scheduling of clearing activities, on a best-efforts basis, to avoid key migratory bird nesting periods.

    - Secondary mitigation will be the development and implementation of an avifauna management plan designed to reduce the likelihood of interaction; establish training protocols for personnel to identify active nests; and protocols for nesting surveys by trained ornithologists in advance of activities.

- Disturbance to potential bat hibernacula within the Study Area will be avoided through development of a mitigation plan, in consultation with NSDNR.

- Allow establishment of shrub or scrub (*i.e.,* non-tree) vegetation in transmission corridors to the extent feasible, to promote their use by SOCI

- Only the amount of lighting required for safe operation of construction and operations activities will be installed. Lights that are not necessary for a particular function will be turned off, and exterior lights will be shielded from above, where the need is identified. Minimal site security lighting will be maintained.

- Locations of watercourses will be avoided where feasible when planning placement of transmission tower foundations, and effective erosion and sedimentation controls will be used around all watercourses (Section 2.6.7). Wetland habitats will be avoided whenever feasible, as many of the SOCI suspected of being present along the transmission line route are associated with wetlands. When wetland avoidance is not possible, vegetation clearing within these habitats will be done by hand, and will be limited to the removal of trees (Section 2.6.7). Trees will be removed within the portion of the cleared area passing through wetland habitat, with shrub cover being left intact, when feasible. Conductors will be drawn by hand or light vehicles such as ATVs across wetlands and winched into position in order to minimize damage to vegetation and substrate.

- Avian avoidance devices may be installed to minimize bird collisions with Project infrastructure in identified high risk areas.

- Restrict use of herbicides in buffer areas around watercourses, and in areas where SOCI are known to occur. These areas will be considered as special management areas within the vegetation management plan.

- Typical best management practices to be used for vegetation management are included in Section 2.8 and will be detailed in a vegetation management plan.

- Adherence to the Project Environmental Management Plan (requirements of the EPP).

8.1.5 CHARACTERIZATION OF RESIDUAL PROJECT ENVIRONMENTAL EFFECTS

Habitat within cleared and immediately adjacent areas in Cape Breton will be changed as a result of Project activities and/or physical works. However, because much of the transmission line parallels existing linear developments, the degree of habitat loss and fragmentation on SOCI will be lessened. Detailed routing within the 2 km-wide Study Area used for the EA will be conducted post-environmental assessment and will be based on detailed habitat mapping at an appropriate scale in order to facilitate micrositing and avoidance of sensitive habitats and SOCI. The loss of mature and interior forest habitat will be minimized to the extent feasible.

Project-related changes in population levels of SOCI that occur within the Study Area, through direct disturbance or indirectly through fragmentation of their habitat, are considered a residual environmental effect. This effect will be reduced by a program of avoidance and mitigation to be applied during final site layout and design as well as Project construction, operation and maintenance. Habitats known to be used by SOCI, or those identified during follow-up surveys, will be avoided during detailed Project planning and design, where feasible, including micrositing of tower foundations. Mitigation has been noted in Section 8.1.4 and includes seasonal considerations during site clearing to reduce effects on breeding avian SOCI. Given this approach, it is likely that the amount of SOCI habitat changed through Project activities will be minimal relative to habitat in non-disturbed areas of the Study Area. The specific amount of habitat that will be disturbed will be determined through application of the ELC, once the Project design is finalized. The results will then be used to create a detailed habitat characterization of the transmission corridor that focuses on SOCI habitat.

The Project could result in changes to the habitat of Canada lynx. However, since the Study Area passes through the eastern limit of the known range of that species in Cape Breton, and the final routing will be selected to minimize disturbance and fragmentation of habitat, the effects on lynx are expected to be minimal.

The residual environmental effect of change in habitat for fish SOCI resulting from erosion and sedimentation and encroachment on watercourses will be minimized with the use of standard erosion and sedimentation controls around watercourses and waterbodies and avoidance where practical (Section 2.6.7).

Despite the implementation of mitigation, there will be some change in habitat for SOCI. Although the change in habitat will be long term, it will be restricted to the cleared corridor. Therefore, considering the mitigation measures that will be implemented, the overall magnitude of the environmental effect is expected to be low. Direct mortality of SOCI resulting from Project activities is a possibility, but will be reduced with avoidance (*e.g*., seasonal avoidance of breeding birds) and other mitigation noted in Section 8.1.4. For example, if clearing activities are undertaken outside of the breeding season for migratory bird SOCI, the potential for mortality of immature birds would be further minimized. However, the process for finalizing the transmission route will include additional work to characterize specific habitats potentially affected by construction activities as part of follow-up programs and Project permitting. Project routing that potentially affects identified critical habitat (or equivalent) for listed species will be reviewed with relevant authorities to explore mitigation options, including avoidance.

The potential for mortality of aquatic SOCI (such as American eel or yellow lampmussel) resulting from erosion and sedimentation will be minimized with the use of standard erosion and sedimentation controls around all watercourses and waterbodies (Section 2.6.7).

Improved access resulting from Project activities may result in an increased risk of mortality to SOCI (*e.g.,* predation, ATV use). Although in some areas increased predation and access by humans will be unavoidable, the resulting residual environmental effect is expected to be low as the Project parallels existing transmission corridors.

Even with the implementation of mitigation, some change in mortality risk for SOCI will occur as a result of the Project. Though the overall environmental effect will be adverse, with careful placement of towers to avoid known locations of SOCI, the magnitude of change in mortality is expected to be low. Change in mortality risk related to construction activities will be short term, and change in mortality risk for operation and maintenance related activities will be long term. The geographic extent of any change in mortality will be restricted to cleared and immediately adjacent areas.

8.1.6 SUMMARY OF RESIDUAL ENVIRONMENTAL EFFECTS

Table 8.1.6 summarizes the residual environmental effects of the Project on SOCI.

Table 8.1.6 Summary of Project Residual Environmental Effects: SOCI (NS)

CHANGE IN SOCI POPULATIONS
Mitigation - Construction
• Detailed mapping, through the application of the ELC will be produced to identify the distribution and known locations of SOCI and associated habitat such that they can be considered during detailed design for avoidance during micrositing of Project routing, transmission tower and foundation placement, and timing of Project activities. Where ranges of mobile SOCI are known, ENL will work with NSDNR and EC-CWS to plan appropriate routing through identified core areas and identified critical habitat within the Study Area. • Reference will be made to the distribution of SOCI habitat when considering Project routing, transmission tower and foundation placement, and timing of Project activities. For example, various types of forested habitat have been identified as SOCI habitat for a number of SOCI that potentially exist within the Study Area—as a result, ENL will work to avoid identified SOCI habitat within the proposed alignment.

Table 8.1.6 Summary of Project Residual Environmental Effects: SOCI (NS)

CHANGE IN SOCI POPULATIONS

- Primary mitigation will be through project planning and scheduling of clearing activities, on a best effort basis, to avoid key migratory bird nesting periods. ENL recognizes that there are geographic differences in nesting periods over the length of the proposed transmission line and will request direction from regulatory agencies in this regard.
- Secondary mitigation will be the development and implementation of an avifauna management plan designed to reduce the likelihood of interaction; establish training protocols for personnel to identify active nests; and protocols for nesting surveys by trained ornithologists in advance of activities.
- Develop a mitigation plan, in consultation with NSDNR to avoid disturbance to potential bat hibernacula.
- Allow establishment of shrub or scrub (*i.e.*, non-tree) vegetation in transmission corridors to the extent feasible, to promote their use by SOCI.
- Only the amount of lighting required for safe operation of construction activities will be installed. Lights that are not necessary for a particular function will be turned off, and exterior lights will be shielded from above, where the need is identified. Minimal site security lighting will be maintained.
- Consider watercourse locations when planning transmission tower and foundation placement.
- Appropriate erosion and sedimentation controls will be implemented to stabilize the watercourse slopes/banks on either side and prevent sediment run-off into the watercourses
- Avoid wetland habitats where feasible.
- Clear vegetation in SOCI habitat by hand, and only remove trees in wetland habitats.
- Draw conductors in wetland habitats by hand or using light vehicles such as ATVs.
- Avian avoidance devices may be installed to minimize bird collisions with Project infrastructure in identified high risk areas.
- Adherence to the Project Environmental Management Plan (requirements of the EPP).

Mitigation – Operation and Maintenance

- Restrict use of herbicides in buffer areas around watercourses, and in areas where SOCI are known to occur. These areas will be considered as special management areas within the vegetation management plan.
- Only the amount of lighting required for safe operation of operation activities will be installed. Lights that are not necessary for a particular function will be turned off, and exterior lights will be shielded from above, where the need is identified. Minimal site security lighting will be maintained.
- Adherence to the Corporate EMS.

Assessment

	Residual Environmental Effects Characteristics							
	Direction	**Magnitude**	**Extent**	**Duration**	**Frequency**	**Reversibility**	**Environmental Context**	**Significance**
Construction	Adverse	Low	Site / Local	Short term	Regular	Reversible	Developed / Undisturbed	Not Significant
Operations	Adverse	Low	Site	Long term	Regular	Reversible	Developed	Not Significant

Follow-up

- Detailed mapping will be prepared using the ELC to identify the distribution and known locations of SOCI and associated habitat. This information will be utilized during detailed design to avoid sensitive areas and/or periods during micrositing of transmission infrastructure (*e.g.*, tower placement) to minimize interactions with SOCI. This information will be developed in consultation with NSDNR and EC.

Table 8.1.6 Summary of Project Residual Environmental Effects: SOCI (NS)

CHANGE IN SOCI POPULATIONS		
• Upon final selection of the grounding facility location additional work will be undertaken to further characterize the sites. • ENL will obtain all required permits for SOCI to construct and operate the Project.		
KEY ***Direction:*** Positive. Adverse. ***Magnitude:*** Low: <5% population or habitat within the Study Area will be exposed to the effect, or no measurable change in habitat availability or population size relative to baseline conditions. Moderate: 5% - 25% of population or habitat within the Study Area will be exposed to the effect, or measurable change in habitat availability or population size relative to baseline conditions that does not cause management concern. High: >25% of population or habitat within the Study Area will be exposed to the effect, or measurable change in habitat availability or population size relative to baseline conditions that does cause management concern.	***Geographic Extent:*** Site – including cleared areas and 200 m beyond. Local: within the Study Area. Regional: within the Bras d'Or Lowlands, Cape Breton Hills, And Cape Breton Coastal Ecodistricts. ***Duration:*** Use quantitative measure; or Short term: During the Project Phase. Medium term: Duration of the Project. Long term: Duration of the Project plus 10 years. Permanent: Will not change back to original condition. ***Frequency:*** Occasionally, once per month or less. Occurs sporadically at irregular intervals. Occurs on a regular basis and at regular intervals. Continuous.	***Reversibility:*** Reversible. Irreversible. ***Environmental Context:*** Undisturbed: Area relatively or not adversely affected by human activity. Developed: Area has been substantially previously disturbed by human development or human development is still present. N/A Not Applicable. ***Significance:*** Significant. Not Significant.

8.1.7 ASSESSMENT OF CUMULATIVE ENVIRONMENTAL EFFECTS

In addition to the assessment of Project-related environmental effects presented above, an assessment of cumulative environmental effects was conducted in regard to other projects and activities that have potential to interact with the Project. For the SOCI VEC, the assessment area for cumulative environmental effects includes the Bras d'Or Lowlands, Cape Breton Hills, and Cape Breton Coastal Ecodistricts, as defined by Neily *et al.* (2003). In large measure, the effects of past and existing projects are reflected in the baseline conditions against which the Project is being assessed. Table 8.1.7 identifies the potential for overlap between the Project residual environmental effects and those of other current projects or activities for which modifications or expansions are planned or underway, and future projects that can reasonably be predicted, within the assessment area. Table 8.1.7 also ranks the potential cumulative environmental effects to SOCI as 0, 1, or 2 based on the degree of interaction with other project or activities and the potential for overlapping effects with the Project.

Table 8.1.7 Potential Cumulative Environmental Effects on SOCI (NS)

Other Projects and Activities with Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects
	Change in SOCI Populations
Port of Sydney Dredging and Infilling (includes PEV)	0
Donkin Export Coking Coal Project	1
Existing Linear Facilities	1
Existing Residential and Recreational Land Use	1
Resource Land Use	1

KEY
0 = Project environmental effects do not act cumulatively with those of other projects and activities.
1 = Project environmental effects act cumulatively with those of other projects and activities, but the resulting cumulative effects are unlikely to exceed acceptable levels with the application of best management or codified practices.
2 = Project environmental effects act cumulatively with those of other projects and activities and the resulting cumulative effects may exceed acceptable levels without implementation of Project-specific or regional mitigation.

Potential Project-related effects on SOCI habitat and mortality of individuals could overlap with similar effects from other projects and activities and therefore result in a cumulative change in SOCI populations.

The Port of Sydney Dredging and Infilling project is a marine-based development located approximately 25 km from the Project. Channel dredging in Sydney Harbour was completed in early 2012, and fish habitat compensation was implemented. Dredging and infilling for the PEV project is planned for late 2012 and also includes fish habitat compensation. Both projects were subject to federal and provincial environmental assessments. No overlapping environmental effects are anticipated with the SOCI VEC.

The proposed Donkin Export Coking Coal Project is planned to be located approximately 40 km from the Maritime Link. This project will involve construction of a mine site and an associated power transmission line. The project is currently undergoing a federal and provincial environmental assessment. As this project will be developed in a previously disturbed industrial setting, and the power line will parallel an existing transmission corridor, the potential for residual adverse environmental effects is reduced, and the magnitude of such potential effects is likely to be low. There will be interaction with the marine environment through the development of a barge load-out facility and trans-shipment location. This may represent a short-term cumulative loss of fish habitat and potential disturbance of marine SOCI. As a result of planned mitigation and habitat compensation, no long-term net loss of fish habitat is expected from either the Donkin Export Coking Coal Project or the Maritime Link. Other mitigation will be employed to reduce potential disturbance to marine and terrestrial SOCI species. The limited habitat disturbance from the Donkin Export Coking Coal Project, combined with its distance from the current Project, will greatly reduce the likelihood of overlapping environmental effects.

Past and present habitat effects associated with existing linear facilities have potential to interact cumulatively with the Project to adversely affect SOCI. Linear facilities, such as roads, highways, railroads, and utility corridors contribute to habitat loss, fragmentation of forest habitats, and the promotion of adverse edge effects. There is also potential for an increase in

mortality of SOCI from increased predation and illegal hunting resulting from greater access to relatively undisturbed habitats.

Road and highways cause relatively more severe fragmentation and disturbance to wildlife SOCI than transmission corridors since they are largely devoid of cover and often support a high volume of vehicle traffic. Transmission RoWs are maintained in a semi-natural state and there is little ongoing human activity to dissuade wildlife from crossing them or utilizing the resulting habitat. However, some species may be reluctant to cross clearings, and where Project infrastructure parallels existing linear developments (roads or transmission lines) there is potential for the combined facilities to present a greater barrier to wildlife movement than the effects of the individual projects alone. For example, studies in agricultural areas in Québec found that bird movement between forest patches decreased with increasing distance between patches (CWS Undated).

There is also potential for cumulative fragmentation of fish SOCI habitat where the Project parallels an existing transmission line or road. However, this fragmentation can be mitigated through construction of fish passage structures, (*e.g*., culverts), at road and highway watercourse crossings. Furthermore, transmission lines typically span watercourses without the need for in-water work, thereby minimizing additional fish habitat fragmentation.

Housing and cottage development within the boundaries of the cumulative effects assessment area has potential to encroach on lands and waters which could result in a gradual loss or change of SOCI habitat. Such changes have potential to be amplified if they overlap with Project-related activities and infrastructure. However, even if such overlap occurs, the combined area of disturbance will still be minimal relative to the proportion of habitat available for SOCI.

Recreational trails are used by off-road vehicles (ATVs and snowmobiles) that can disturb wildlife habitat important to SOCI, the effects of which can overlap cumulatively with new development corridors. The Project could result in the connection of otherwise separate trails, leading to more off-road vehicle traffic.

Resource land use, including forestry, agriculture, and small-scale quarries, has potential to interact cumulatively with the Project to affect SOCI populations through removal, destruction, or disturbance of individuals and/or habitats. Although no large-scale industrial forestry activity is known to occur within the assessment area, forestry activities (clearcuts, logging roads, harvesting) on private woodlots could interact with the Project. However, potential cumulative effects on SOCI will be mitigated as a result of compliance with provincial forestry guidelines, and by the natural regeneration of harvested areas in the vicinity of the Project.

8.1.8 DETERMINATION OF SIGNIFICANCE

Construction and operation activities associated with the Project may result in adverse effects which could result in a change in SOCI populations in Nova Scotia, which could persist over the life of the Project. The potential change in SOCI populations could be attributable to direct and indirect disturbance resulting in potential loss of habitat and increased mortality of SOCI

individuals. With the implementation of proposed mitigation and environmental protection measures, the residual environmental effect of a change in SOCI populations is predicted to be not significant.

As discussed above, the level of Project-related environmental effects interacting cumulatively with effects of other existing activities is considered to be low. Furthermore, with the application of proposed mitigation measures the residual cumulative environmental effect of a change in SOCI populations is rated not significant.

In summary, residual environmental effects and cumulative effects on a change in SOCI populations are rated not significant.

8.1.9 FOLLOW-UP AND MONITORING

Detailed mapping will be prepared using the ELC to identify the distribution and known locations of SOCI and associated habitat. This information will be utilized during detailed design to avoid sensitive areas and/or periods during micrositing of transmission infrastructure (*e.g.,* tower placement) to minimize interactions with SOCI. This information will be developed in consultation with NSDNR and EC.

Upon final selection of the grounding facility location additional work will be undertaken to further characterize the sites.

With the implementation of proposed mitigation described for the SOCI VEC, and in consideration of the residual environmental effects rating criteria, no additional monitoring is planned at this time. Additional work and/or monitoring may be required pending the results of mitigation required for the Project.

8.2 SOCIO-ECONOMIC ENVIRONMENT

The Socio-economic Environment was selected as a VEC in consideration of potential Project interactions with local communities, including effects on existing infrastructure and current uses of land in the immediate vicinity of the Project; and the potential effects of Project activities on the economy.

8.2.1 SCOPE OF ASSESSMENT

The assessment of the socio-economic environment considers the potential direct and indirect effects of Project activities on land and resource use and the local/regional economy. The assessment of potential Project interactions with the Commercial Fisheries VEC is assessed in Section 7.2 and the assessment of potential Project interactions with the Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq VEC is assessed in Section 8.4.

8.2.1.1 Regulatory Setting

The Cape Breton Regional Municipality (CBRM) Municipal Planning Strategy was initially prepared in 2004 and most recently updated in 2011. It sets out the general rules of land development including terms and conditions governing land use and the management of service infrastructure. The policy states that utility operators are responsible to ensure facilities and structures do not adversely affect the surrounding landscape. The Pottle Lake water supply area is protected under the Pottle Lake Watershed Protected Water Area Regulations made under subsection 106(5) of the *Environment Act*.

In 2007, the government of Nova Scotia passed the *Environmental Goals and Sustainable Prosperity Act (EGSPA)*. This Act commits to protecting 12 percent of Nova Scotia's land, by 2015, to meet protection goals while taking potential land use conflicts into consideration (EGSPA 2007). It is intended that development activities such as resource extraction and land development will not be permitted on these lands. However, activities such as hunting and operating motorized vehicles will be permitted (EGSPA 2007). Most of the lands that will be protected under this Act will become wilderness areas, nature reserves, or provincial parks. As of December 31, 2011, a total of 8.8 percent (484,800 ha) has been legally protected mostly as wilderness areas, nature reserves, or provincial parks (NSE 2012b). Maps and descriptions of the 12 percent lands under review are available on the NSE website at: http://www.gov.ns.ca/nse/12percent/maps.asp.

8.2.1.2 Selection of Environmental Effects and Measurable Parameters

The environmental assessment of the socio-economic environment is focused environmental effects related to change in land and resource use and change in economy.

Change in land and resource use was chosen as an environmental effect due to potential interactions between the Project and current uses of nearby land for general development, including industrial, commercial, residential and recreational uses.

Change in economy was chosen as an environmental effect due to potential interactions of the Project with the local economy (*i.e.*, employment, business income) of communities in the vicinity of the Project.

The measurable parameters used for the assessment of environmental effects and rationale for their selection are provided in Table 8.2.1.

Table 8.2.1 Measurable Parameters for the Socio-Economic Environment

Environmental Effect	Measurable Parameter	Rationale for Selection of the Measurable Parameter
Change in Land and Resource Use	Community infrastructure	• Includes potential interactions with services (*e.g.*, water, sewer, communications), as well as potential effects from worker influx including the need for temporary accommodations and services
	Recreational land use	• Identification of recreational use of land and potential future protected areas proximate to the Project will help determine the potential risk to such activities
	Private land use proximate to and within the Study Area	• Understanding residential or other private land ownership that will be intersected by the Project, including properties that may be purchased, will provide an indication of the extent of potential effects on such assets.
	Resource activities	• Project activities may involve changes to current and future use of natural resources within and proximate to the Project Area (*e.g.*, forestry, mining, farming).
Change in Economy	Change in employment	• Construction and Operation/Maintenance of the Project may result in temporary changes to the current local/regional employment profile.
	Change in business income	• The Project will likely have a measureable effect on businesses within CBRM.

8.2.1.3 Temporal and Spatial Boundaries

The temporal boundaries for the assessment of the potential environmental effects of the Project on the Socio-economic Environment VEC include the periods of Construction and Operation and Maintenance. Some land use activities are seasonal (*e.g.*, recreational activities); however, some level of activity can be expected on the land year-round.

The spatial boundaries for the environmental effects assessment of the Socio-economic Environment VEC are:

- Change in land and resource use – the Study Area and immediately adjacent land where Project activities, including accidents, malfunctions and unplanned events, could potentially interact with current and continued use of land and resources.
- Change in economy – the CBRM is used as the basis for assessing the effects on the Socio-economic Environment.

8.2.1.4 Threshold for Determining the Significance of Residual Environmental Effects

Significant residual adverse environmental effects are defined as:

- Change in land and resource use – where the use of land for the Project and related facilities is not compatible with adjacent land and resource use activities as designated through a regulatory land use planning process (*e.g.*, CBRM Municipal Planning Strategy).

- Change in land and resource use – a Project-related change or disruption that widely restricts or degrades present land and resource use to a point where the activities cannot continue at current levels and for which the environmental effects are not mitigated.
- Change in economy – where the Project results in an unmitigated extended loss of employment or business income within the Study Area.

It should be noted there can be positive environmental effects, particularly with respect to change in economy.

8.2.2 BASELINE CONDITIONS

Baseline conditions for this VEC are based on research conducted in support of the Project.

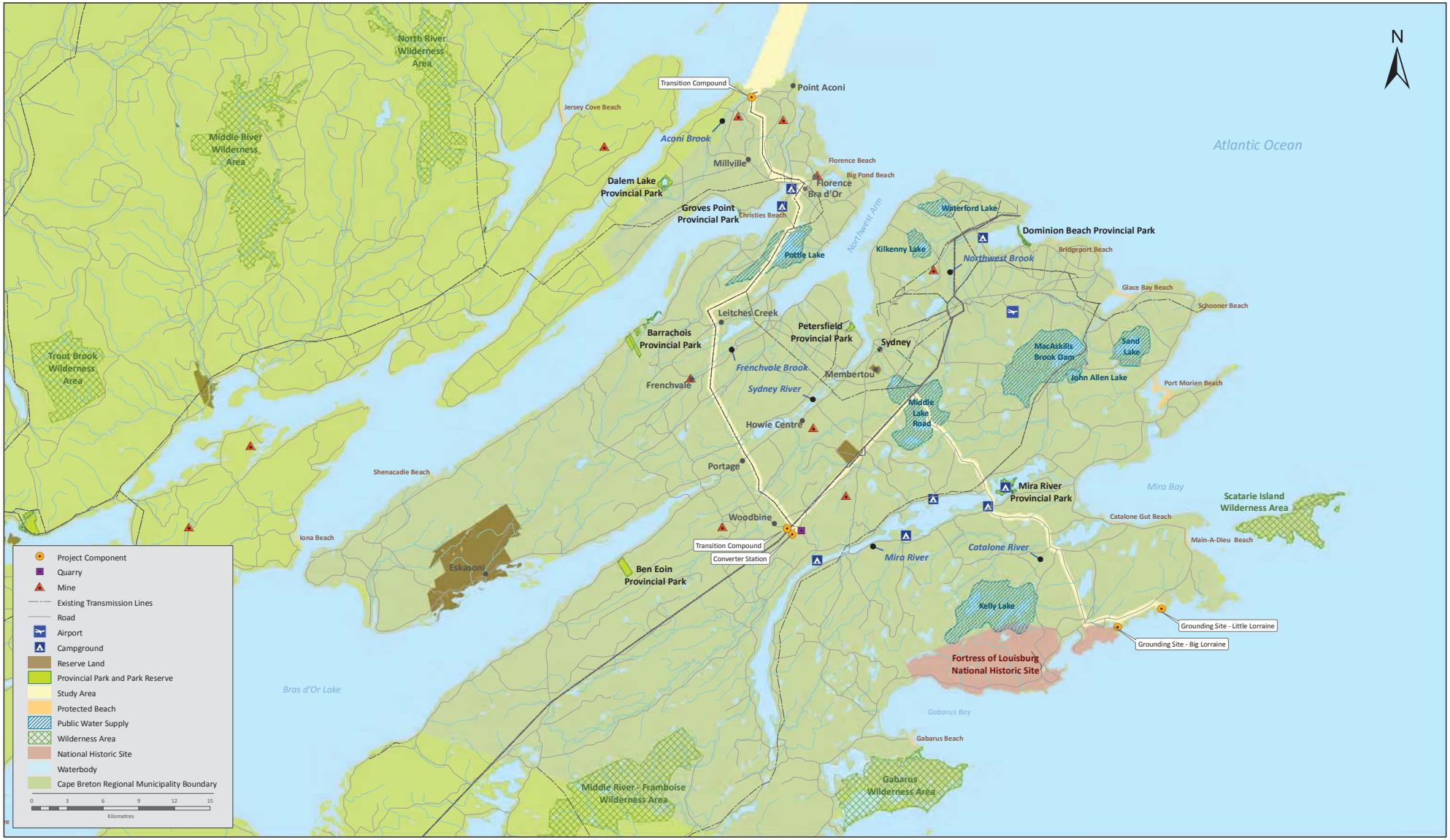
8.2.2.1 Land and Resource Use

The most prevalent uses of land resources within CBRM include the following, which are further described below:

- communities (infrastructure and services);
- residential land use;
- recreational land use; and
- resource land use.

Cape Breton Regional Municipality

The Project crosses through the northern segment of the CBRM (Figure 8.2.1), which has the same boundaries as Cape Breton County. CBRM was created in 1995 under the *Nova Scotia Municipal Government Act* and offers a full range of community services and infrastructure (roads, water, sewer, waste disposal, fire control, transit), complemented by provincial and federal services.



Emera Newfoundland & Labrador

Coordinate System: UTM NAD 83 Zone 20

Scale: 1:300,000

Data Sources: Geobase - Road Network; Geogratis - National Atlas

Date: 9/26/12

Land and Resource Use
Cape Breton, Nova Scotia

FIGURE 8.2.1

ENL0069

The transmission corridor from the Point Aconi Generating Station to Woodbine covers approximately 46 km, adjacent to an existing transmission line. The main communities or settlements within several kilometres of the corridor, as shown on Figure 8.2.1, are described below.

- Millville: The transmission corridor runs south just to the east of the farmland along the King Grove Road, turning east about one km from the TCH and crossing the Prince Mine Road and on to the Point Aconi Road before it crosses St. Andrews Channel.

- Bras d'Or/Florence: The transmission corridor crosses St. Andrews Channel and runs parallel to the TCH, passing through the community of Bras d'Or. The corridor crosses Alder Point Road, the rail line and the Bras d'Or-Florence Road (to the southwest of Florence), then turns south across the TCH, crossing Villa Drive and heading southwest through wooded land parallel to and mid-way between Georges River Road and Route 125.

- Frenchvale/Beechmont: The transmission corridor continues southwest through wooded land parallel to Route 223, turning south and crossing Route 223 at Upper Leitches Creek. It continues south towards Frenchvale and then to the southeast towards Beechmont, crossing the Beechmont Road towards Blacketts Lake and the Coxheath Road. The Frenchvale/Beechmont area is composed largely of woodland and is sparsely populated; the 2006 Census listed a population of 1,125 (Statistics Canada 2006).

- Howie Centre/Sydney Forks: The transmission corridor crosses Coxheath Road and Kings Road (Route 4) some five km to the south of Howie Centre and two km south of Sydney Forks, where the area's population of 3,350 and several businesses are concentrated. Once across Route 4, the corridor route passes through woodland as it crosses Meadows Road and reaches Woodbine.

CBRM is responsible for construction and maintenance of local streets within the municipality. The CBRM is served by the J.A. Douglas McCurdy Airport, near Sydney, which is owned and operated by the Sydney Airport Authority. The airport is classified as an airport of entry and is staffed by Canada Border Services. The Ports of Sydney encompass both Sydney and North Sydney harbours. Vessel activity in Sydney includes cruise ships, cargo, break-bulk, bulk and fuel transport. The Atlantic Canada Bulk Terminal sits adjacent to the Harbourside Commercial Park. Facilities at the Sydport Industrial Park on the western side of the harbour handle bulk, containers and heavy-lift cargo. The Sydney Marine Terminal (SMT) accommodates 40-50 cruise ships per year, carrying about 40-50,000 passengers. North Sydney is the NS terminus for Marine Atlantic's passenger, vehicle and freight service to NL.

The CBRM water utility supplies water to almost 80,000 residents, operating, maintaining and managing eight water treatment plants and associated infrastructure (*e.g.*, pumping stations, water lines) (CBRM 2012b). Water is supplied to the main communities from six lakes and three community wells in the region (CBRM 2012b). Residents in smaller communities rely mainly on individual wells (CBRM 2012b). The Project crosses the provincially protected water supply watershed of Pottle Lake.

The main communities in CBRM are connected to sewage systems, while homes and businesses in rural areas rely on septic systems or small treatment facilities. Other municipal and community infrastructure includes electrical and communication infrastructure.

- The Cape Breton Regional Police Service delivers policing services throughout CBRM. Fire and emergency services are provided by CBRM through full-time and volunteer personnel.

Mi'kmaq Communities

CBRM also includes several Mi'kmaq communities, shown on Figure 8.2.1. Those described below are closest to the Project.

- Membertou is an urban First Nation, located in a Band area of 1.1 km^2 in southeast Sydney. The community has a total membership of 1,250, with 726 persons residing in the Band area in 2006 (the identified Aboriginal population numbered 680). The resident population has increased by approximately 17 percent since 2001. The community has a relatively young median age of 24.7 years. For CBRM as a whole, the median age is 44.3 years and for NS, 41.8 years (Statistics Canada 2006).
- Eskasoni is the most populous First Nation in NS. It is located on the Bras d'Or Lakes in a Band area of 36.1 km^2 about 50 km southwest of Sydney. Eskasoni has a total membership of about 4,000, of whom 2,935 resided in the Band area in 2006. The resident population has increased by about eight percent since 2001. The median age of the population is 20.9 years, about half that of CBRM and NS.
- Chapel Island is a rural First Nation, located on the Bras d'Or Lakes in a Band area of 5.6 km^2. It is located in Richmond County on Route 4, about 80 km southwest of Sydney and just to the northeast of St. Peter's. The Chapel Island Reserve includes the island, Mniku, a traditional meeting place for the Mi'kmaq of what are now the Maritime Provinces. Chapel Island had a total population of 445 in 2006, of which 430 identify as Aboriginal. The resident population has increased by about six percent since 2001. The median age of the population is 19.4 years.

Residential Land Use

The number of occupied dwelling units in CBRM has remained fairly stable within the range of 42,000 to 43,000 over recent years (Table 8.2.2).

Table 8.2.2 CBRM Housing Characteristics

Occupied Dwellings	2001	2006
Single detached	n.a.	32,270
Semi-detached	n.a.	2,765
Row houses	n.a.	560
Apartments	n.a.	6,370
Other	n.a.	1,120

Table 8.2.2 CBRM Housing Characteristics

Occupied Dwellings	2001	2006
Total	**41,645**	**43,085**
Owned dwellings	30,485	31,705
Rented dwellings	11,160	10,745
Average value of owned ($)	66,482	87,935
n.a.: not available		

Source: Statistics Canada 2001; 2006 (Numbers reported here are rounded by Statistics Canada; totals may not add up due to rounding.)

Table 8.2.3 summarizes available temporary accommodations available in CBRM. The occupancy rate averaged 44% in 2010, ranging seasonally from 25-30 percent in winter to 60-65 percent in July-August. Motels dominate the supply, followed by hotels, inns, and bed and breakfast facilities.

Table 8.2.3 CBRM Short Term Accommodations

Accommodation Type	Rooms (2010)
Hotel	771
Motel	1,075
Inn	376
Bed and Breakfast	253
Total	**2,475**

Source: NSERDT 2010

Recreational Land Use

Recreational land uses include hunting and fishing, motorized (*e.g.*, ATV) and non-motorized (*e.g.*, hiking) activities and cabin and cottage use. Protected areas such as wilderness areas, nature reserves, provincial parks, as well as the Fortress of Louisbourg National Historic Park, also provide recreational opportunities.

Additional recreational activities may be available in the future with new protected areas under EGSPA. Currently, NSE is leading a five-year process to reach the 12 percent goal. The selection process involves consideration of a series of factors including natural values (*i.e.*, preserving biodiversity), social values (*i.e.*, hiking and hunting), and reducing conflict (*i.e.*, considering all land uses). This process consists of four steps:

1. 12% Lands Identification (2009-11);
2. 12% Lands Review (2011-12);
3. Public Consultation (2012); and
4. Final Plan (2013-15).

NSE has completed the first round of public workshops, information sessions, and meetings on the 12% lands review process. Comments and submissions are under review and a draft Parks and Protected Areas Plan is being developed. This plan will be released to the public in early 2013, and additional consultation will be held after the release of the document.

At the current stage in Project design consideration is being given to locating the grounding site in Cape Breton at either Little Loraine or Big Lorraine. Little Lorraine (land parcel #222), which contains 4 sites and includes Big Lorraine, has been identified as part of the 12 percent of lands under review by EGSPA, and is therefore subject to further evaluation. This 404 ha of provincial Crown Land is considered a coastal ecosystem, characteristic of the Louisbourg Coastal Cliffs Natural Landscape (NSE 2011c). The description of features at this site includes ecological values such as 9 km of undisturbed coastline, at least two species of rare artic/alpine plants, seabird nesting colonies, and a variety of coastal ecosystems including forest, barren and wetland. Recreational values include hiking and hunting (NSE 2011c).

It will not be determined if Little Lorraine is a proposed protected site until the draft Parks and Protected Areas plan is released in 2013.

Due to the loss of moose habitat and low moose populations throughout mainland NS, moose hunting is restricted to the north western region of Cape Breton, including Management Zone 3, which the Study Area transects. Part of the Study Area also falls within Deer Management Zone 111. Bear, small game, furbearers, and wildfowl (*e.g.*, pheasant, grouse) are also hunted in NS, including within the Study Area.

A number of waterbodies and watercourses within and near the Study Area are used for recreational fishing. The Nova Scotia Department of Fisheries and Aquaculture (NSDFA) is responsible for the management of recreational freshwater fisheries. Species managed by NSDFA include speckled trout, rainbow trout, brown trout, smallmouth bass, Atlantic salmon, yellow perch, white perch, chain pickerel, smelt, landlocked salmon, striped bass and shad (NSDFA 2012). NS has six Recreational Fishery Management Zones. Each Zone has a Recreational Fisheries Advisory Board, coordinated and chaired by representatives from the NSDFA. The Project is located within Zone 1. The NSDFA also maintains recreational boat launches throughout the province, in cooperation with the Department of Natural Resources and DFO. The Point Aconi boat launch is located within the Study Area.

There are four scheduled salmon rivers in the Study Area as illustrated in Figure 8.2.1:

- Northwest Brook;
- Sydney River;
- Frenchvale Brook; and,
- Aconi Brook.

Within the Study Area unofficial use of trails by recreational vehicles is likely; this includes existing transmission lines. The Study Area intersects an existing Snowmobile Association of Nova Scotia (SANS) main trail and connector trail, near Point Aconi (Figure 8.2.1). Cape Breton Highlands have maintained a reputation for salmon fishing and moose hunting throughout Eastern Canada and the Northeastern United States. These activities are centred in the western region of Cape Breton (Inverness County). Based on information available in the databases compiled by the NSDNR, as well as the Nova Scotia Registry of Joint Stock Companies, there are no outfitters or registered guides found within the Study Area (NSRJSC 2012). Barachois and Groves Point provincial parks are located within CBRM, but are not crossed by the Study Area.

Cape Breton is popular for seasonal residences (cottages and summer homes) for both Nova Scotians and non-residents. Crown land, which is under the administration and control of the Minister of Natural Resources, comprises about 24% (approximately 1.4 million hectares) of the province (NSDNR 2012a). In addition to this, most of the submerged lands (the sea bed) along the coastline are also considered Crown land. Exceptions include federally and privately owned waterlots. Most cottages and cabins are constructed on private property and detailed information on housing type (*i.e.,* seasonal, recreational, or permanent residential) is not readily available.

Resource Land Use

NSDNR is responsible for the development, management, conservation, and protection of forest, mineral, and wildlife resources and parks throughout the province. NSDNR is also the administrative agency responsible for provincial Crown land. The province's forest resource is located within the Acadian Forest Ecozone (AFE), a unit within a continental classification system used for developing and coordinating strategic policies at regional, national and international levels. Within the AFE, the province has been divided into 39 Ecodistricts (NSDNR 2012b). The Study Area straddles the Cape Breton Hills, Bras d'Or Lowlands and Cape Breton Coastal Ecodistricts (Figure 8.1.1). In 2010, approximately three percent of the total timber harvested in the province was taken from CBRM. Eight registered sawmills operate in CBRM although none operate within the Study Area.

The province is divided into five Regional Agricultural Territories with regional representatives providing extension services and other resources to farmers. The Study Area falls within the Cape Breton Regional Agricultural Territory (NSDA 2012). The Cape Breton agriculture industry is made up of relatively small-scale farms, based primarily on livestock, vegetable crops and horticulture. In 2006, the 62 farms registered within CBRM accounted for 2.5 % of all farms in operation in the Province (Table 8.2.4). Field reconnaissance determined that some active agricultural lands, used for mostly for pasture and forage, occur in the northern portion of the Study Area.

Table 8.2.4 Number of Agriculture Producers by Type, CBRM (2011)

Commodity	Number of Farms
Beef	15
Hay/ forage	15
Horticulture	12
Sheep	8
Blueberry	5
Dairy	5
Poultry	2
Total	**62**

Source: Koziel pers. comm. 2012.

Small pockets of industrial mineral production and a renewed interest in coal represent the main mining activity and potential of Cape Breton (NSDNR 2012b). A proposal to re-develop the Donkin coalfield is currently undergoing environmental review (the Donkin Export Coking Coal Project). The mineral industry in Cape Breton accounts for a substantial volume and value of exports. Until 2000, coal was the leading mineral produced. Various industrial minerals including gypsum, stone, sand, gravel and salt currently dominate production. Mineral production within CBRM occurs in rural areas and is confined largely to quarrying stone and gravel from approximately 100 small aggregate pits. NSDNR reports that there are emerging opportunities for the development of limestone and marble resources as well as further definition and promotion of newly discovered clay resources in southern Cape Breton (NSDNR 2012b). The most substantial industrial mineral production occurs at the NSPI Glen Morrison limestone quarry, which delivers approximately 100,000 tonnes per year to the Point Aconi generating station for sulphur removal during coal combustion.

8.2.2.2 Economy

The NS economy is currently dominated by service sector industries, which accounted for 52.3 percent of provincial GDP in 2010 (Table 8.2.5). This is up from a 48.8 percent share in 1997. In contrast, goods producing industries accounted for 22 percent of GDP, down from 24 percent in 1997. Public administration remained fairly stable over the period at just under 26 percent of GDP. The rising relative importance of the service sector mirrors structural change elsewhere in the Canadian economy, reflecting mainly the decline in manufacturing, as activity in this sector experienced a global shift to lower wage countries (CBRM 2010).

Table 8.2.5 Nova Scotia Economy, GDP and Employment by Sector (2010)

Sector	Gross Domestic Product		Employment	
	$ 2002 millions	% of total	P-Y 000s	% of total
Agriculture, Forestry, Fishing and Hunting	753.2	2.8%	15.1	3.3%
Mining and Oil and Gas Extraction	599.0	2.2%	2.7	0.6%
Utilities	590.0	2.2%	4.2	0.9%
Construction	1,588.6	5.8%	32.1	7.1%
Manufacturing	2,464.6	9.1%	32.7	7.2%
Good Producing	**5,995.4**	**22.0%**	**86.8**	**19.2%**
Wholesale Trade	1,301.8	4.8%	11.8	2.6%
Retail Trade	1,985.7	7.3%	64.5	14.2%
Transportation and Warehousing	1,099.8	4.0%	18.5	4.1%
Information and Cultural Industries	1,103.4	4.1%	19.4	4.3%
Finance and Insurance, Real Estate and Management	6,528.8	24.0%	48.0	10.6%
Professional, Scientific and Technical Services	898.2	3.3%	23.7	5.2%
Accommodation and Food Services	637.3	2.3%	28.5	6.3%
Other Services (except public administration)	672.6	2.5%	18.5	4.1%
Service Producing	**14,227.6**	**52.3%**	**232.9**	**51.4%**
Educational Services	1,606.5	5.9%	33.6	7.4%
Health Care and Social Assistance	2,406.0	8.8%	68.7	15.2%
Public Administration	2,971.9	10.9%	30.7	6.8%
Public Administration	**6,984.4**	**25.7%**	**133.0**	**29.4%**
Information and Cultural Industries	1,103.4	4.1%	19.4	4.3%
Total NS GDP	**27,207.4**		**452.7**	

Source: Statistics Canada 2010

CBRM is shifting from manufacturing and heavy industry to a service-based economy. The heavy industry, mainly coal mining and steel manufacturing that had characterized the regional economy for much of the twentieth century, has gradually lost its competitiveness and markets. This has put more emphasis on the service sector as the basis for economic development efforts. These efforts have included tourism development, attracting service-related businesses such as call centres, and supporting the growth and diversification of educational institutions, including Cape Breton University (CBRM 2010).

The changing industrial mix is also illustrated by labour force data. The summary in Table 8.2.6 shows the sharp decline in the resource sector, in which the labour force declined by 38 percent between 1996 and 2006. Manufacturing declined by 33 percent over this period, and substantial declines were also noted in wholesale and retail trade and finance and real estate. Overall, the

labour force share accounted for by the goods producing sectors (resources, construction and manufacturing) dropped from about 22 percent to 17 percent of the regional total, while service industries increased their share from 78 percent to 83 percent (CBRM 2010).

Table 8.2.6 CBRM – Experienced Labour Force by Industry

Industry	1996	2001	2006	% Change 2006/1996
Agriculture and other resources	3,675	2,620	2,285	-38%
Construction	3,075	5,265	3,415	11%
Manufacturing*	2,970	-	1,980	-33%
Wholesale trade	1,305	6,950	875	-33%
Retail trade*	7,060	-	6,345	-10%
Finance and real estate	1,415	1,380	1,275	-10%
Health care and social services	6,040	9,975	7,335	21%
Educational services*	3,905	-	3,600	-8%
Business services	4,465	6,510	8,495	90%
Other services	10,425	9,920	9,560	-8%
Total	**44,335**	**42,620**	**45,165**	
*Construction/manufacturing, wholesale/retail trade, health and education combined in 2001				

Source: Statistics Canada 1996; 2001; 2006

The Membertou First Nation holds licences in several important fisheries, thereby providing employment on fishing vessels. Local construction projects also employ about 10 percent of the labour force. Much of the labour force works in the delivery of community services including education and health, as well as various business services in the Membertou corporate division (Table 8.2.7).

The Eskasoni labour force characteristics reflect the structure of the local economy, also with its overall dependence on service activities. The community also holds licences in several important fisheries (crab, lobster, shrimp, tuna) providing employment for over 10 percent of the labour force on its fleet of 13 vessels. Construction and manufacturing combine to employ another 10 percent. About two-thirds of the labour force works in the delivery of community services including education and health, as well as various service-related businesses (Table 8.2.7).

The Chapel Island economy features activity across several sectors including fisheries, construction, manufacturing and a range of services. The community is home to a thriving oyster aquaculture industry, and holds licences in the crab, lobster and tuna fisheries. Construction and manufacturing account for 13 percent of total employment. About two-thirds of the labour force is engaged in the delivery of community services including education and health, as well as various related businesses (Table 8.2.7).

Table 8.2.7 First Nations Labour Force by Industry (2006)

	Membertou	Eskasoni	Chapel Island
Fisheries and other resources	20	70	25
Construction	30	45	10
Manufacturing	0	10	10
Wholesale trade	0	0	0
Retail trade	25	80	10
Finance and real estate	0	0	0
Health care and social services	20	95	20
Educational services	20	130	15
Business services	25	35	15
Other services	140	160	55
Total	**280**	**625**	**155**

8.2.3 POTENTIAL PROJECT-VEC INTERACTIONS AND ENVIRONMENTAL EFFECTS

Table 8.2.8 ranks for each Project activity the potential effects on the socio-economic environment as 0, 1 or 2 based on the level of interaction with the Project and the degree of associated environmental effect.

Table 8.2.8 Potential Project Environmental Effects to the Socio-Economic Environment (NS)

Project Activities and Physical Works	Potential Environmental Effects	
	Change in Land Use and Resources	Change in Economy
Construction		
Site Access and Site Preparation	1	1
Transmission and Grounding Line Infrastructure	1	1
Converter Station	1	1
Grounding Facilities	1	1
Operation and Maintenance		
Overland Power Transmission	0	1
Power Conversion	0	0
Maintenance		
Regular Inspection	1	1
Repair to Infrastructure	1	1
Vegetation Management	1	1

KEY
0 = No interaction.
1 = Interaction occurs; however, based on past experience and professional judgment, the resulting effect can be managed to acceptable levels through standard operating practices and/or through the application of best management or codified practices. No further assessment is warranted.
2 = Interaction occurs, and resulting effect may exceed acceptable levels without implementation of specified mitigation; further assessment of options to mitigate is warranted.

Construction of the Project is rated as 1 for its potential interactions with land and resource use and economy. Clearing will take place near the existing alignment and Project interactions with community infrastructure and services (*e.g.,* communications, electricity) are not anticipated. In the unlikely event that services are interrupted, appropriate mitigation will be in place such that services will be restored or temporarily replaced within a short timeframe.

Work undertaken within the Pottle Lake Watershed Protected Water Area will be done in compliance with the requirements specified in the draft Pottle Lake Source Water Protection Plan (CBRM 2010). These requirements are based on the following documents:

- Pottle Lake Watershed Protected Water Area Regulations*;*
- Best Management Practices/Forest Planning in Municipal Drinking Water Supply Areas, Nova Scotia (NSE 2005); and
- General Provisions for Pesticide Use in Nova Scotia.

These documents contain best management practices to reduce potential environmental effects. In addition to the requirements of any permits, standard construction mitigation described in Section 2.6.7 will mitigate potential interactions with water supply areas. These include set-backs from water bodies for clearing, groundbreaking activities, materials storage, and fuelling. The CBRM Planning and Development Department will be contacted as part of the planning process.

Blasting will not be carried out within the Pottle Lake Watershed Protected Water Area.

As noted in the draft Pottle Lake Source Water Protection Plan, ENL recognizes the Protected Water Area as a no-herbicide zone. This designation will be reflected in the EMP for the Project and the CBRM Planning and Development Department will be contacted before any work is planned in this area.

Any work undertaken within the proposed EGSPA land parcel #222 that contains both the Little Lorraine and Big Lorraine grounding site options, will be contained within a small area and restricted to the southern-most corner of the parcel. Little Lorraine will require approximately 4 ha and Big Lorraine approximately 1 ha to accommodate the grounding line, grounding site, and road access. All standard construction mitigation, described in Section 2.6.7, for wetlands, watercourses, and flora and fauna, including avifauna, will be implemented to reduce any potential environmental effects. As noted above, this parcel of land is part of the 12 percent land review under EGSPA and may be designated in the future as a protected area. This potential designation will be reflected in the EMP for the Project and EGSPA will be contacted before any work is planned in this area.

During Project construction, trails used by ATVs and snowmobiles may need to bypass active construction areas. ENL will work with the SANS to identify appropriate bypass routes, if required. Appropriate signage will be used to notify trail users of any detours.

Residential land use may be affected by easement or procurement; and construction activities may affect enjoyment of residential properties as a result of noise, or a change in the viewscape.

Baseline noise monitoring was conducted where high and/or sustained noise generating activities are planned (*e.g.*, HDD sites, converter stations) in order to identify noise receptors and quantify the potential effects of noise on these receptors. A plan will be developed and implemented to mitigate noise to comply with existing regulatory requirements. This plan may include the installation of sound barriers, and/or timing restrictions on work. As discussed in Section 2.6.7, mitigation best practices for noise during construction will be implemented.

Project design will maximize use of existing roads and transmission lines thereby reducing the amount of additional land that will be disturbed. Harvesting timber on private lands will be subject to agreement of a legal interest in the land and/or a timber harvesting agreement. ENL will seek the appropriate development permit from the CBRM, and will follow requirements of that permit during Construction and Operations and Maintenance activities.

Most visible Project elements in NS are located along existing linear developments or near existing utility structures where changes to existing public views are not expected to be greatly affected.

Construction activities that may interfere with the current use of land by temporarily restricting access or affecting enjoyment of properties will be small in magnitude and short in duration such that substantial residual adverse environmental effects are not anticipated. There may be unofficial use of the existing transmission line corridor for recreational use (*e.g.*, ATVs), that is temporarily disrupted or subject to restricted access during construction. Hunting is not permitted within most of the CBRM due to proximity to residences; hunting that is affected will be dispersed to areas adjacent to the Project.

A majority of the transmission route will be constructed parallel with, or adjacent to, existing transmission lines. In areas where transmissions lines converge ENL will continue to engage landowners to identify routing alternatives. The Project will not result in environmental effects that will restrict or degrade present land and resource use within the Study Area to a point where activities cannot continue at current levels or be mitigated to an acceptable level.

The Project will have a positive effect on the local and regional economy. In addition to direct employment, the goods and services that will be required will be sourced from within CBRM and the Province as much as feasible. Local suppliers of goods and services (*e.g.,* construction, accommodations, materials) will be provided with an opportunity to learn about the Project and register their interest for involvement at supplier information sessions. Although the main contributions to the economies of CBRM and the Province will occur during Project construction, these benefits are not anticipated to be substantial over the long term.

Power transmission and conversion during operation of the Project is ranked as 0 for change in land and resource use and 1 for change in economy. The majority of Project effects on land use

will occur during construction activities. Normal operation of the Project is not anticipated to have an effect on land or resource use. Operation of the Project will require additional staffing, although this positive effect is not anticipated to be substantial over the long term.

Infrastructure inspection and repair and vegetation management are rated as 1 for change in land and resource use and change in economy. These activities will be undertaken in accordance with mitigation described in Section 2.6.7 and the EPP. These activities will occur infrequently and are short in duration and therefore minimal interaction with land and resource use is anticipated. These activities will be undertaken as part of existing normal maintenance and inspection programs, and are not expected to contribute substantially to the economy.

As the result of Project design, the application of standard mitigation, and adherence to existing regulations and policies, the Project is not anticipated to result in significant residual adverse environmental effects on land or resource uses or the economy.

8.2.4 CUMULATIVE ENVIRONMENTAL EFFECTS

In addition to the assessment of Project-related environmental effects presented above, an assessment of cumulative environmental effects was conducted in regard to other projects and activities that have potential to interact with the Project. For the socio-economic VEC, the assessment area for cumulative environmental effects is CBRM. In large measure, the effects of past and existing projects are reflected in the baseline conditions against which the Project is being assessed. Table 8.2.9 identifies the potential for overlap between the Project residual environmental effects and those of other current projects or activities for which modifications or expansions are planned or underway, and future projects that can reasonably be predicted, within the assessment area. Table 8.2.9 also ranks for each Project activity the potential cumulative environmental effects as 0, 1, or 2 based on the level of interaction with other projects or activities and the degree of associated environmental effects.

Table 8.2.9 Potential Cumulative Environmental Effects on the Socio-Economic Environment (NS)

Other Projects and Activities with Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects	
	Change in Land Use and Resources	Change in Economy
Port of Sydney Dredging and Infilling	1	1
Donkin Export Coking Coal Project	1	1
Existing Linear Facilities	1	0
Existing Residential and Recreational Land Use	1	0
Resource Land Use	1	0

KEY
0 = Project environmental effects do not act cumulatively with those of other projects and activities.
1 = Project environmental effects act cumulatively with those of other projects and activities, but the resulting cumulative effects are unlikely to exceed acceptable levels with the application of best management or codified practices.
2 = Project environmental effects act cumulatively with those of other projects and activities and the resulting cumulative effects may exceed acceptable levels without implementation of Project-specific or regional mitigation.

The Port of Sydney Dredging and Infilling project and the Donkin Export Coking Coal Project will cause changes to the landscape through ground disturbance and construction activities. Where there is potential for overlap of environmental effects, (*e.g.*, the transmission line for the Donkin project) the residual environmental effects on land and resource use will be minimal, short-lived, low in frequency, and are not considered significant. These planned projects will contribute to a positive change in the economy, as there is potential for a cumulative change to employment and businesses in the area as a result of multiple projects being planned within the same region. The timelines for these projects are not fully defined; however it is unlikely that they would overlap temporally. The skill sets required for each of the projects are quite different, and a labour shortage as a result of direct competition for workers is not anticipated.

More general development that occurs incrementally over longer periods of time, such as economic growth, population increase and infrastructure expansion has resulted in the current patterns of land and resource use throughout CBRM. It is unlikely that the Project will substantially contribute to a cumulative change in overall land use patterns since the transmission lines and associated facilities will be sited adjacent to existing right of ways and infrastructure. Although existing linear facilities have permanently changed the use of some land (areas are now paved or inaccessible), land availability is not considered constraining in this part of the province, and land and resource use can generally be accommodated in conjunction with these developments.

The Project will not be displacing any established businesses, and will not interfere with access to local businesses or tourism locations. The Project is expected to generate revenue for the area through direct expenditures by construction workers and personnel. Therefore, anticipated cumulative socio-economic effects of the Project are expected to be positive.

8.2.5 DETERMINATION OF SIGNIFICANCE

In consideration of the nature of the interactions and the planned implementation of proven mitigation, the potential environmental effects of all Project activities on the Socio-economic Environment VEC during any phase of the Project, including cumulative environmental effects, are rated not significant.

8.2.6 FOLLOW-UP AND MONITORING

ENL will undertake a noise assessment where high-noise events and/or sustained noise-producing activities are planned (*e.g.*, converter stations, HDD locations). A plan will be developed and implemented to mitigate noise to the extent feasible (*e.g.*, installation of sound barriers, and/or timing restrictions on work).

With the implementation of proposed mitigation described for the Socio-Economic Environment VEC, and in consideration of the residual environmental effects rating criteria, no additional monitoring is planned at this time. Additional work and/or monitoring may be required pending the results of mitigation required for the Project.

8.3 ARCHAEOLOGICAL AND HERITAGE RESOURCES

Archaeological and heritage resources has been selected as a VEC in recognition of the interest of provincial and federal regulatory agencies which are responsible for management of these resources, the general public as a whole, and potentially affected Mi'kmaq First Nations that have an interest in the preservation and management of heritage resources related to their culture.

Archaeological and heritage resources are defined as any physical remnants found on top of and/or below the surface of the ground, including on or below the sea floor, that inform us of past human use of, and interaction with, the physical environment. These resources may be from the earliest period of human occupation (Precontact) or from the more recent Historic Periods. These resources are relatively permanent features of the environment and their integrity is highly susceptible to the effects of construction and ground disturbing activities. The context, or archaeological landscape, of built heritage resources is also considered susceptible to changes, such as the addition of new structures in the immediate area of such resources.

Potential interactions between the Project and archaeological and heritage resources that may cause potential environmental effects are discussed in this section. For example, any surface or subsurface Project-related disturbance within an identified high potential area has the potential for interaction with archaeological and heritage resources. Potential changes to the context of built heritage resources are considered, with emphasis on the damage or removal of structures.

8.3.1 SCOPE OF ASSESSMENT

8.3.1.1 Regulatory Setting

Archaeological and heritage resources in Nova Scotia are administered by the Heritage Division of the Nova Scotia Department of Communities, Culture and Heritage.

Archaeological sites are considered to be non-renewable resources and the disturbance of such resources is only authorized under strictly controlled conditions imposed by terms of a Heritage Research Permit (Archaeology) or Heritage Research Permit (Palaeontology). These permits are only issued to qualified personnel by the provincial government through the Minister responsible for the administration of the *Special Places Protection Act*. This Act provides for the preservation, protection, regulation, exploration, excavation, acquisition and study of archaeological and historical remains and palaeontological sites which are considered important parts of the natural or human heritage of Nova Scotia. In addition to meeting the requirements under the *Special Places Protection Act*, all phases of the Maritime Link Project have involved, and will continue to involve, engagement with the Mi'kmaq Rights Initiative (KMKNO), including the conduct and review of studies in support of the Project.

8.3.1.2 Selection of Environmental Effects and Measurable Parameters

The environmental assessment of the archaeological and heritage resources is focused on change in archaeological and heritage resources.

This environmental effect reflects the *CEAA* requirements for the assessment according to the definition of environment as "any structure, site, or thing that is of historical, archaeological, palaeontological or architectural significance."

The measurable parameter for the selected environmental effect is included in Table 8.3.1

Table 8.3.1 Measurable Parameters for Archaeological and Heritage Resources

Environmental Effect	Measurable Parameter	Rationale for Selection of the Measurable Parameter
Change in archaeological or heritage resource	Presence/absence of an archaeological or heritage resource	• Mitigation required only if an archaeological or heritage resource is identified, is deemed significant by provincial agencies, and unavoidable by construction activities.

8.3.1.3 Temporal and Spatial Boundaries

The temporal boundaries for the assessment of the potential environmental effects of the Project on archaeological and heritage resources include the periods of construction, and operation and maintenance.

Construction activities carried out at any time of the year can affect any archaeological and heritage resources encountered. Ground disturbances are relatively short-term; however, any potentially adverse effects on archaeological and heritage resources would be permanent. Environmental effects to archaeological and heritage resources are most likely to occur during the construction phase.

The operation and maintenance phase of the Project is not anticipated to involve ground disturbance in previously undisturbed areas or the addition of Project-related infrastructure in areas near built heritage resources; thus this phase of the Project will have limited potential to cause adverse environmental effects to these resources.

The spatial boundaries for the environmental effects assessment of archaeological and heritage resources are defined below.

The Study Area (500 m corridor centred on the transmission route) represents the maximum area within which Project-related environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence (Figure 1.2.4). In the marine environment this includes the nearshore area.

CBRM is the area within which cumulative environmental effects for archaeological and heritage resources may occur, depending on physical and biological conditions and the type and location of other past, present, and reasonably foreseeable projects.

8.3.1.4 Threshold for Determining the Significance of Residual Environmental Effects

A **significant adverse residual environmental effect** on archaeological and heritage resources is defined as:

- An unmitigable change in a Project-related disturbance to, or destruction of, all or part of an archaeological or heritage resource considered by the provincial heritage regulatory agency to be of major importance due to factors such as rarity, undisturbed condition or context, spiritual importance or research importance.

8.3.2 BASELINE CONDITIONS

Existing conditions for the Archaeological and Heritage Resources VEC were established through research and field work conducted in 2011 and 2012 by CRM and through discussions with archaeologists from CRM. CRM undertook the archaeological screening and reconnaissance, which included, but was not limited to, background research, the development and application of an archaeological potential model, preliminary aerial reconnaissance, and limited pedestrian surveys. Chester Marine Services Limited undertook a marine archaeology resource assessment of the nearshore approaches at Point Aconi in two phases: an archaeological screening and an archaeological video survey. The marine assessment included, but was not limited to, background research, a foreshore site visit with a focus on the intertidal zone and an underwater survey using a submerged video camera towed from a support vessel along the preferred approach to the anchor site near the Point Aconi Generating Station. A brief summary of existing conditions in regard to archaeological and heritage resources, with emphasis on the Study Area is provided below.

8.3.2.1 Land Based Conditions

Existing Knowledge from Previous Studies

With the exception of the Fortress of Louisbourg, there has been little archaeological research conducted within the limits of CBRM. At the time that research was undertaken, there were 28 provincially registered archaeological sites within CBRM, 19 of these dating to the Historic period (*i.e.,* post-European contact) and 9 dating to the Precontact period. No registered archaeological sites are located within the Study Area.

Project Related Archaeological and Heritage Resource Studies

In NS, archaeological research is conducted under the general terms of the Special Protection Act. An application was prepared and submitted to the Heritage Division of the Nova Scotia Department of Communities, Culture and Heritage, for a Heritage Research Permit.

The archaeological assessment of the proposed transmission corridor consisted of a number of components. Discussions with provincial regulators were initiated at the beginning to outline the Project. A logistical overview of the proposed transmission corridor was then completed to familiarize the study team, evaluate access to key locations and facilitate the finalization of strategies for subsequent preliminary reconnaissance and field truthing.

Background research was used to identify cultural and environmental factors that contributed to human occupation and exploitation within the study corridor. The goal of the research was to identify known archaeological and historic sites, and delineate areas of archaeological potential. This research involved a review of environmental factors as well as historical settlement and development patterns within the study corridor and included a review of relevant documentation available through the Nova Scotia Museum, the Nova Scotia Archives and the Beaton Institute. Research focussed on identification of areas of potential settlement or resource processing, supplemented by a review of land grant records, historic maps and local/regional histories. Topographic maps and aerial photographs, both current and historic, were used to identify environmental and physiographic features, such as topography and watercourse features, that would have influenced human settlement and resource exploitation patterns. The historical and cultural information was then integrated with the environmental and physiographic data and incorporated into the archaeological potential model.

The development and implementation of an archaeological potential model allowed for the identification of areas of high archaeological potential within the defined study corridor. Modelling was based on 1:50 000 NTS mapping and the result was a visual, GIS-based depiction of archaeologically sensitive areas within the proposed development areas. The model was developed through the analysis of a range of natural and environmental variables that contributed to decisions made regarding past land use. The generated output identified locations that, based on key natural and environmental data, exhibited the most favourable conditions for Precontact or historic settlement. The validity of the output was assessed by cross-referencing with available datasets, such as air photos, detailed topographic maps, and inventories of known archaeological and historic sites. Field reconnaissance, both pedestrian and aerial, was also used to test the validity of the model and to refine the areas identified as exhibiting high archaeological potential. The natural and environmental variables incorporated into the archaeological potential model included proximity to water (essential for drinking and transportation), slope, aspect and elevation. Seven areas of high archaeological potential were flagged for avoidance, field inspection or subsurface testing. The results were then used to create a detailed constraint map by applying the archaeological potential model to the base maps developed by ENL for environmental and engineering applications.

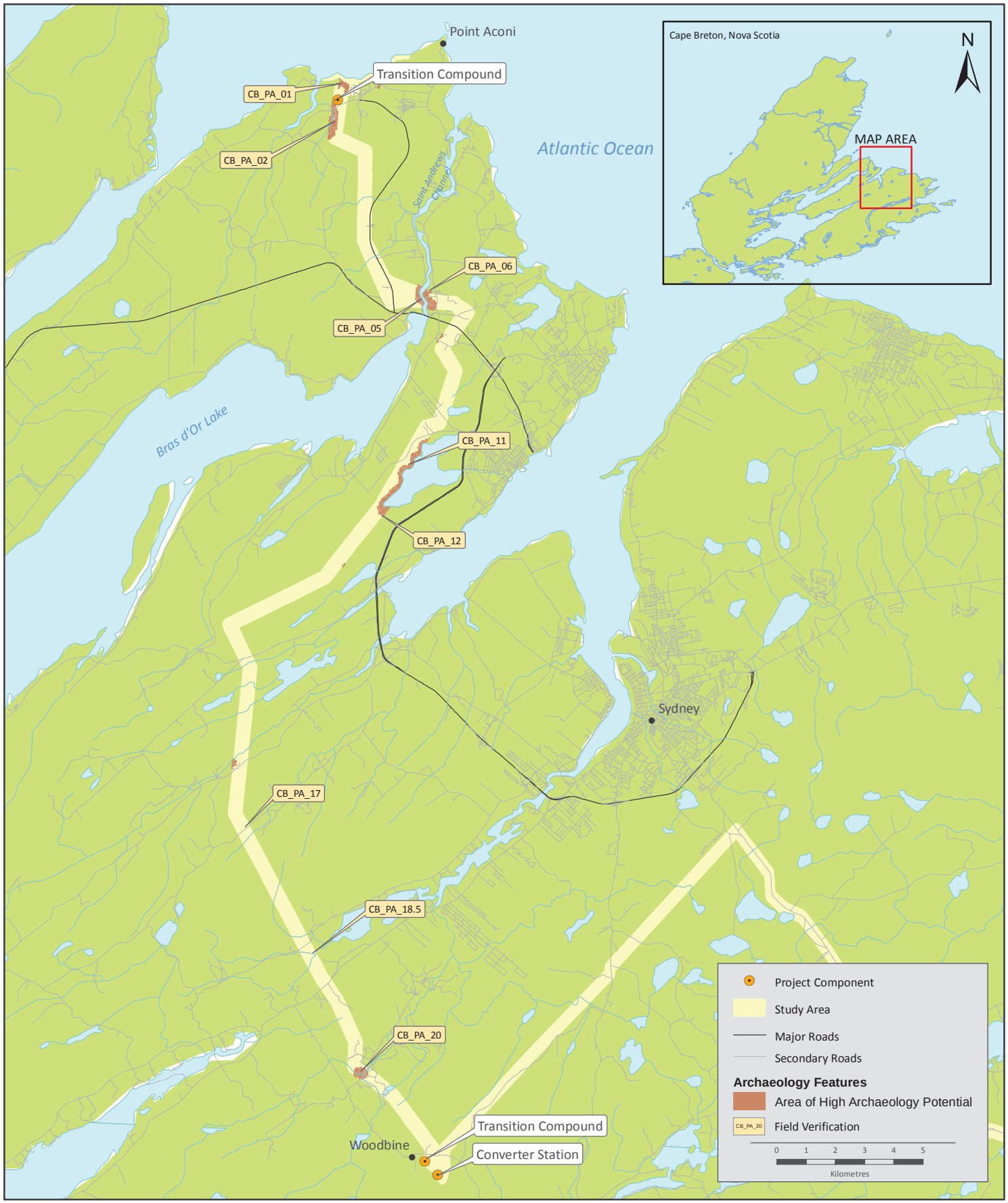
A preliminary reconnaissance was then undertaken to conduct high level visual assessment of the proposed transmission corridor, to evaluate areas that were ascribed as high archaeological potential from the model. Results of the preliminary field reconnaissance, and historic background research, increased the number of areas of high archaeological potential to 20.

The preliminary field reconnaissance was followed by a more extensive program of archaeological reconnaissance to expand upon the preliminary results. Known as field truthing, this program involved the documentation of encountered archaeological sites and the development of strategies for the protection and preservation of those resources. As field truthing was undertaken in areas ascribed high archaeological potential on the basis of background research, archaeological modelling and/or preliminary reconnaissance, the boundaries of those areas were re-evaluated. Discoveries of unfavourable environmental conditions (*e.g,.* steep slopes, hummocky terrain, boggy ground, etc.) or extensive ground disturbance resulted in the reduction of some areas of high archaeological potential and the elimination of others. In general, high archaeological potential was ultimately ascribed to areas of relatively flat, dry ground within 50 metres of visible archaeological features, significant water bodies or watercourses, as well as to areas where such conditions were present within 100 metres of a renowned avenue for Precontact and/or historic travel, such as the Little Bras d'Or.

Each of the 20 areas of high archaeological potential was ground truthed during the field program. This resulted in the elimination of 11 sites due to the re-assessment of archaeological potential from high to low, typically as a result of existing disturbances, wet ground conditions or other conditions that made the area unsuitable for human occupation (Figure 8.3.1). Results from the remaining nine areas are summarized in Table 8.3.2.

Table 8.3.2 Areas of High Archaeological Potential (NS)

Area Identifier	Description
CB-PA-01	Located on the northern shore of Boularderie Island, west of existing Point Aconi Generating Station, extending to Battleman Beach; an area of dry, level ground located around Battleman Beach and nearby lagoon. Three building foundations and a stone-lined well were observed along an abandoned north-south road, possibly associated with Murdock Battleman (c.1877).
CB-PA-02	Located along an unnamed tributary of Mill Pond; dry areas suitable for occupation and/or utilization.
CB-PA-05	Located where the Study Area intersects with Point Aconi Road and the Little Bras d'Or, within the community of Mill Creek; areas of level, dry ground along watercourse suitable for occupation and/or utilization.
CB-PA-06	Located along the eastern bank of the Little Bras d'Or Lake and Alder Point Road within the community of Florence; level and dry areas along the watercourse suitable for occupation and/or utilization.
CB-PA-11	Located where the Study Area encompasses the northwestern shore of Pottle Lake; areas of dry, level ground along the lake shoreline.
CB-PA-12	Located where the Study Area intersects Ross Road and the southwestern tip of Pottle Lake; dry, level ground identified along the alignment of the road (est. prior to 1877) and along lakeshore.
CB-PA-17	Located where the Study Area intersects with Beechmont Road, where a community was established prior to 1877; areas of high, dry, level ground, extant cellar foundations of two historic dwellings.
CB-PA-18.5	Located along Portage Brook; presence of an old road, possibly representing a modified segment of a former portage trail between Bras d'Or Lake and Sydney Harbour.
CB-PA-20	Located at the crossing of Dan Morrisons Brook and where a tributary of the brook meets the main channel; intermittent dry and relatively level areas of undisturbed ground suitable for occupation and/or utilization.



Emera Newfoundland & Labrador

Coordinate System: UTM NAD 83 Zone 20
Scale: 1:175,000

Data Sources: Archaeological Features - CRM Group
Road Layer - GeoBase
Date: 18/12/2012

FIGURE 8.3.1

Areas of High Archaeological Potential
Cape Breton

ENL108

Historic period archaeological resources were also documented at the landfall location (Figure 8.3.1). This area, identified as CB-PA-01 during ground truthing, is the location of three building foundations and a stone-lined well. These features are believed to be remnants of the farmstead of Murdock Battleman, who is identified as the owner of the land on an 1877 map (Church 1877).

Marine-Based Conditions

An assessment of potential marine-based archaeological and heritage resources within the Study Area was undertaken for the Project in 2012. Research for the nearshore marine study (*i.e.*, within 10 km) included a review of documents available from the Nova Scotia Museum of Natural History (NSMNH), the Maritime Museum of the Atlantic, the Nova Scotia Archives, the NS Department of Natural Resources library, and the Cape Breton University's Beaton Institute. Research databases included Heritage Division's Archaeological Site File, Department of Defence, and the records of the Receiver of Wreck for wrecks within the nearshore environment. In 2011, Fugro Geosurveys Inc. conducted geotechnical and geophysical surveys in the form of side-scan sonar, sub-bottom profile and multi-beam bathymetry which were also reviewed for indications of archaeological potential, specifically for shipwrecks. The study also involved direct consultation with individuals and organizations with knowledge of the archaeological, geological and historical resources in the target area.

The marine floor in the nearshore environment is composed of exposed bedrock surrounding submerged river channels. The location of highest archaeological potential for submerged Precontact resources is along the margins of the submerged river channels. With the exception of anomalies identified during the video survey, which were determined to be remnants of modern lobster pots, no cultural material was identified within the Study Area in the nearshore (up to 10 m depth). Due to the dynamic nature of the marine environment, however, any cultural resources remaining on the seafloor would likely not have context or be in-situ; in general the potential for encountering submerged Precontact archaeological sites within the Study Area is low. In the area where the seafloor is exposed bedrock, the potential for Precontact archaeological resources is nonexistent. In the river channels, the potential for encountering such resources is low with virtually no expectation of encountering intact cultural deposits.

Two shipwrecks have been identified as potentially being within the Study Area. These are noted in Table 8.3.3 below, and Figure 8.3.2. As the reported location of these wrecks is based on documentary rather than physical evidence, it is currently impossible to definitively say whether they fall within the Study Area.

Table 8.3.3 Known Shipwrecks with Potential to be Within the Study Area (NS)

Vessel	Official #	Date Wrecked	Tonnage	Type	Hull
ANNA MARIA	Unknown	1872	Unknown	Schooner	Wood
ESPERANCE	Unknown	1843	55.4	Schooner	Wood

Emera Newfoundland & Labrador

Coordinate System: UTM NAD 83 Zone 20

Scale: 1:50,000

Date: 22/11/2012

Data Sources:
Geobase - Road Network
Geogratis - National Atlas
Shipwreck - DND
Archaeological Potential Model: CRM

FIGURE 8.3.2

Areas of High Archaeological Potential and Shipwrecks
Point Aconi, Cape Breton

ENL0111

8.3.2.2 Palaeontological Resources

The palaeontological resources within the Study Area occur in the Pictou-Morien Group of the Sydney Coal Field and are found in Upper Carboniferous shales and sandstones. The Carboniferous period (360 to 290 million years ago) was a time when the Province was located close to the equator and the warm climate resulted in lush vegetation dominated by large trees and swamp plants. This vegetation, along with many small animals, died, decayed and was buried in these deposits that became peat and, much later, coal.

Upper Carboniferous deposits protected under the *Special Places Protection Act* are found within the CBRM (NSMNH 1996c), as follows:

- coastline northeast of Cranberry Head - 34 coal seams and fossil trees;
- New Waterford to Morien Bay - Coastal exposure of Upper Carboniferous sediments of the Cape Breton coalfield, with plant and animal fossils including species found nowhere else in North America; and
- Point Aconi – coastal exposure of Upper Carboniferous sediments with upright tree fossils; plant imprints and fossils in the shales along the beach.

From Point Aconi to Port Morien, there is palaeontological potential within the estuary of Sydney River in the form of exposures of sandstone and coal seams. There is a seam of coal one metre thick in the cliff at Point Aconi, and plant fossil can be found within the shales on the beach. The Point Aconi deposits are located within the Study Area.

8.3.3 POTENTIAL PROJECT-VEC INTERACTIONS AND ENVIRONMENTAL EFFECTS

8.3.3.1 Potential Project-VEC Interactions

Table 8.3.4 ranks for each Project activity the potential effects on archaeological and heritage resources as 0, 1, or 2 based on the level of interaction with the Project and the degree of environmental effect.

Table 8.3.4 Potential Project Environmental Effects to Archaeological and Heritage Resources (NS)

Project Activities and Physical Works	Potential Environmental Effects
	Changes in Heritage or Archaeological Resources
Construction	
Site Access and Site Preparation	2
Transmission and Grounding Line Infrastructure	2
Grounding Facilities	2

Table 8.3.4 Potential Project Environmental Effects to Archaeological and Heritage Resources (NS)

Project Activities and Physical Works	Potential Environmental Effects
	Changes in Heritage or Archaeological Resources
Subsea Cables	2
Operation	
Overland Power Transmission	0
Power Conversion	0
Subsea Power Transmission	0
Maintenance	
Regular Inspection	0
Repair to Infrastructure	0
Vegetation Management	0

0 = No interaction
1 = Interaction occurs; however, based on past experience and professional judgment, the resulting effect can be managed to acceptable levels through standard operating practices and/or through the application of best management or codified practices. No further assessment is warranted.
2 = Interaction occurs, and resulting effect may exceed acceptable levels without implementation of specified mitigation. Further assessment is warranted.

Construction activities are rated as between 2, and are further discussed below.

It is not anticipated that Operations and Maintenance of the Project will have an environmental effect on archaeological and heritage resources. These activities will take place where construction-related ground disturbance has already occurred, and thus where archaeological and heritage resources will have been fully assessed and mitigated to reduce the potential for adverse environmental effects to a level which is considered not significant. Therefore, the potential environmental effects of all Project activities during operation and maintenance on the Archaeological and Heritage Resources VEC are rated not significant and will not be considered further in this assessment.

8.3.3.2 Potential Environmental Effects

Project-related environmental effects could occur as a result of ground disturbance associated with construction activities. Ground disturbance related to Project activities could lead to a change in the integrity of an archaeological or heritage resource. Archaeological resources could be directly affected by machinery, or the context of the materials may be altered through a change to the surrounding environment.

Background research, archaeological potential modeling and field reconnaissance have resulted in the identification of areas of high archaeological potential and several historic period archaeological features within the Study Area.

8.3.4 MITIGATION OF PROJECT ENVIRONMENTAL EFFECTS

The mitigation described below is recommended to reduce the potential for adverse environmental effects on the Archaeological and Heritage Resource VEC. All phases of archaeological assessment and testing will be conducted in consultation with Heritage Division in advance of any Project-related ground disturbances. The Mi'kmaq of Nova Scotia will be engaged throughout this process. Specific mitigation measures are as follows:An archaeological assessment of the Project Study Area has been undertaken to determine areas of high archaeological potential.

- Avoidance of physical disturbance, where feasible, of areas of high archaeological potential and/or of known archaeological and heritage resources within the Study Area during final routing.

- Where avoidance of high potential areas for archaeological or heritage resources within the Project Study Area is not possible, archaeological testing will be undertaken to determine resources are present, in consultation with the Provincial Heritage Division.

- Identified resources will be protected through avoidance, mitigation through archaeological recovery, or a combination of these measures. These activities will occur in advance of any Project-related ground disturbances, to the satisfaction of the Provincial Heritage Division.

- Any excavations, or similarly invasive work, undertaken in areas of high potential will be completed with a qualified archaeologist present.

- The area of ground disturbance for the subsea cables will be assessed for archaeological resources using available geophysical data (*e.g.,* side scan sonar, magnetometer), during final routing. Avoidance of potential marine archaeological resources is the primary form of mitigation for the Cabot Strait.

- Provide the NSDNR and/or the Provincial Museum palaeontological staff the opportunity to examine any newly exposed bedrock known or suspected to contain fossils.

- If unexpected archaeological and heritage resources are encountered during construction activities, the EPP will contain a contingency plan for this situation.

- Paleontological assessment will be completed prior to ground disturbance in areas of high fossil potential near Point Aconi.

8.3.5 CHARACTERIZATION OF RESIDUAL PROJECT ENVIRONMENTAL EFFECTS

With the proposed mitigation, the residual environmental effects of the Project on archaeological and heritage resources are anticipated to be low in magnitude and highly localized. Where potential effects to such resources are not mitigated, the duration of the adverse environmental effect will be permanent and irreversible as archaeological and heritage resources are non-

renewable and cannot be returned to their original context if altered or removed from the ground.

Any further archaeological investigations have the potential to contribute to the overall knowledge of the specific archaeological site, former inhabitants and cultural context.

8.3.6 SUMMARY OF RESIDUAL ENVIRONMENTAL EFFECTS

Table 8.3.5 summarizes the residual environmental effects of the Project on archaeological and heritage resources.

Table 8.3.5 Summary of Project Residual Environmental Effects: Archaeological and Heritage Resources (NS)

CHANGE IN ARCHAEOLOGICAL OR HERITAGE RESOURCES

Mitigation - Construction

- An archaeological assessment of the Project Study Area has been undertaken to determine areas of high archaeological potential.
- Avoidance of physical disturbance, where feasible, of areas of high archaeological potential and/or of known archaeological and heritage resources within the Study Area during final routing.
- Where avoidance of high potential areas for archaeological or heritage resources within the Project Study Area is not possible, archaeological testing will be undertaken to determine resources are present, in consultation with the Provincial Heritage Division.
- Identified resources will be protected through avoidance, mitigation through archaeological recovery, or a combination of these measures. These activities will occur in advance of any Project-related ground disturbances, to the satisfaction of the Provincial Heritage Division.
- Any excavations, or similarly invasive work, undertaken in areas of high potential will be completed with a qualified archaeologist present.
- The area of ground disturbance for the subsea cables will be assessed for archaeological resources using available geophysical data (*e.g.*, side scan sonar, magnetometer), during final routing. Avoidance of potential marine archaeological resources is the primary form of mitigation for the Cabot Strait.
- Provide the NSDNR and/or the Provincial Museum palaeontological staff the opportunity to examine any newly exposed bedrock known or suspected to contain fossils.
- If unexpected archaeological and heritage resources are encountered during construction activities, the EPP will contain a contingency plan for this situation.
- Paleontological assessment will be completed prior to ground disturbance in areas of high fossil potential near Point Aconi.

Assessment

	Residual Environmental Effects Characteristics							
Construction	**Direction**	**Magnitude**	**Extent**	**Duration**	**Frequency**	**Reversibility**	**Environmental Context**	**Significance**
	Adverse	Low	Local	Permanent	Occasionally	Reversible	Developed	Not Significant

Follow-up

- The objective during Project planning is to avoid areas with known archaeological resources. Areas designated as “high potential” for archaeological resources through surveys completed to date will be avoided where possible. If these areas cannot be avoided archaeological testing will be undertaken to determine if resources are present. Identified resources will be protected through avoidance and/or mitigation through archaeological

Table 8.3.5 Summary of Project Residual Environmental Effects: Archaeological and Heritage Resources (NS)

CHANGE IN ARCHAEOLOGICAL OR HERITAGE RESOURCES		
recovery, in consultation with the Provincial Heritage Division. Any excavations, or other similar disturbances, undertaken in areas of high potential will be completed with a qualified archaeologist present. As required, protocols will be developed in Project EPPs to govern such undertakings. • Upon final selection of the grounding facility location, an archaeological assessment will be undertaken to characterize the proposed site.		
KEY ***Direction:*** Positive. Adverse. ***Magnitude:*** Low: Mitigated disturbance to, or removal of, a Heritage or Archaeological Resource High: Unmitigated disturbance to, or destruction of, an archaeological or heritage resource considered to be of major importance ***Geographic Extent:*** Local: within the Study Area Regional: CBRM	***Duration:*** Use quantitative measure; or Short term: During the Project Phase. Medium term: Duration of the Project. Long term: Duration of the Project plus 10 years. Permanent: Will not change back to original condition. ***Frequency:*** Occasionally, once per month or less. Occurs sporadically at irregular intervals. Occurs on a regular basis and at regular intervals. Continuous. ***Reversibility:*** Reversible. Irreversible.	***Environmental Context:*** Undisturbed: Area relatively or not adversely affected by human activity; includes Area of New Access. Developed: Area has been substantially previously disturbed by human development or human development is still present. N/A Not Applicable. ***Significance:*** Significant. Not Significant.

8.3.7 CUMULATIVE ENVIRONMENTAL EFFECTS

In addition to the assessment of Project-related environmental effects presented above, an assessment of cumulative environmental effects was conducted in regard to other projects and activities that have potential to interact with the Project. For the Archaeology and Heritage Resources VEC, the assessment area for cumulative environmental effects is CBRM. In large measure, the effects of past and existing projects are reflected in the baseline conditions against which the Project is being assessed. Table 8.3.6 identifies the potential for overlap between the Project residual environmental effects and those of other current projects or activities for which modifications or expansions are planned or underway, and future projects that can reasonably be predicted, within the assessment area. Table 8.3.6 also ranks for each Project activity the potential for cumulative environmental effects as 0, 1, or 2 based on the level of interaction with other projects and the degree of associated environmental effects.

Table 8.3.6 Potential Cumulative Environmental Effects to Archaeological and Heritage Resources in CBRM

Other Projects and Activities with Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects
	Change in Heritage or Archaeological Resources
Port of Sydney Dredging and Infilling	0
Donkin Export Coking Coal Project	0
Existing Linear Facilities	1
Residential and Recreational Land Use and Development	1
Resource Land Use	1

KEY
0 = Project environmental effects do not act cumulatively with those of other projects and activities.
1 = Project environmental effects act cumulatively with those of other projects and activities, but the resulting cumulative effects are unlikely to exceed acceptable levels with the application of best management or codified practices.
2 = Project environmental effects act cumulatively with those of other projects and activities and the resulting cumulative effects may exceed acceptable levels without implementation of project-specific or regional mitigation.

The port of Sydney dredging and infilling projects and the Donkin Export and Coking Coal project are located in areas where human disturbance and infilling are prevalent. The environmental assessments for the port of Sydney projects did not identify high potential areas for encountering archaeological or heritage resources. The environmental assessment for the Donkin project identified two historic-period archaeological sites on the Donkin headland that will either be avoided by project activities or effects will be mitigated. Archaeological and heritage resources are protected under the Nova Scotia *Special Places Protection Act* and any projects undergoing environmental assessment in the province are required to avoid and/or mitigate potential interactions with such resources. The Heritage Division of the Department of Communities, Culture and Heritage maintains an inventory of all registered sites where archaeological and heritage resources are known to occur.

Small-scale resource developments, *e.g.*, aggregate quarries, farming operations and forest harvesting, may also result in destruction or damage to archaeological and heritage resources. However, the extent to which this has occurred is not generally known. Similarly, there is no comprehensive data available on the degree to which such resources have been destroyed or disturbed by commercial, housing and cottage development and recreational activities

Reconnaissance of the Study Area has identified high priority areas for archaeological and heritage resources, and following more detailed field studies these will be avoided or effects will be mitigated. The inventory of sites and permitting process noted above, combined with the results of baseline surveys and on-site investigations prior to construction, and known mitigation measures, reduce the potential for cumulative effects. Therefore, with the application of best management practices and compliance with legislation, the potential for residual cumulative environmental effects on archaeological and heritage resources is not considered likely.

8.3.8 DETERMINATION OF SIGNIFICANCE

With the implementation of proposed mitigation (*e.g.*, avoidance and/or archaeological mitigation and consultation with the Heritage Division) and in consideration of the residual environmental effects rating criteria, the potential environmental effects of construction activities are rated not significant.

Assuming that the results of reconnaissance surveys are considered in transmission routing and the placement of towers and other Project infrastructure, and that best practice mitigation is implemented, it is concluded that the residual cumulative environmental effects of the Project on archaeological and heritage resources are rated not significant.

8.3.9 FOLLOW-UP AND MONITORING

The objective during Project planning is to avoid areas with known archaeological resources. Areas designated as “high potential” for archaeological resources through surveys completed to date will be avoided where possible. If these areas cannot be avoided archaeological testing will be undertaken to determine if resources are present. Identified resources will be protected through avoidance and/or mitigation through archaeological recovery, in consultation with the Provincial Heritage Division. Any excavations, or other similar disturbances, undertaken in areas of high potential will be completed with a qualified archaeologist present. As required, protocols will be developed in Project EPPs to govern such undertakings.

Upon final selection of the grounding facility location, an archaeological assessment will be undertaken to characterize the proposed site.

With the implementation of proposed mitigation (*e.g.,* avoidance, additional archaeological investigation and where required, recovery of artifacts), as implemented in consultation with the Provincial Heritage Division, and in consideration of the residual environmental effects rating criteria, no additional monitoring is planned at this time. Additional work and/or monitoring may be required pending the results of mitigation required for the Project.

8.4 CURRENT USE OF LAND AND RESOURCES FOR TRADITIONAL PURPOSES BY THE MI’KMAQ

This section assesses the effects of the Project on the current use of lands and resources in the Cabot Strait for traditional purposes by the Mi’kmaq of Nova Scotia. The current use of lands and resources for traditional purposes includes hunting and fishing for food and ceremonial purposes, other harvesting activities for subsistence, social, cultural, ceremonial, and medicinal purposes, as well as the use of sacred sites.

The Current Use of Land and Resources for Traditional Purposes by the Mi’kmaq was selected as a VEC due to the potential for the Maritime Link Project to interact with current use of land and resources for traditional purposes by the Mi’kmaq, as well as to satisfy federal and provincial regulatory requirements.

The Mi'kmaq of Nova Scotia possess knowledge of traditional and current hunting, trapping, fishing, gathering, and other land and resource uses that can meaningfully contribute to Project-related research and the environmental assessment process.

The Project has potential to interact with the current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia in two distinct geographic areas/jurisdictions - Cape Breton and the Cabot Strait. This section considers the environmental effects assessment for potential Project interactions in the Study Area in Cape Breton. Potential Project effects on current Mi'kmaq land and resource use for traditional purposes in Study Area within the Cabot Strait are assessed in Section 7.4.

The following VECs also have linkages with the VEC discussed in this section: Commercial Fisheries VEC (Section 7.2); SOCI VEC (Section 8.1); Socio-economic Environment VEC (Section 8.2); and the Archaeological and Heritage Resources VEC (Section 8.3).

8.4.1 SCOPE OF ASSESSMENT

8.4.1.1 Regulatory Setting

Section 16(1) of *CEAA* (1992) requires, *inter alia*, an assessment of the significance of the environmental effects of a project, and consideration of any mitigation measures that are technically and economically feasible. "Environmental effect" is a defined term under *CEAA*. It includes any change that the Project may cause to the environment on the current use of lands and resources for traditional purposes by Aboriginal persons. [s. 2(1) of *CEAA*] An environmental assessment conducted under *CEAA* must therefore assess the significance of any such effects and consider technically and economically feasible mitigation measures for such effects.

The Environmental Assessment Regulations pursuant to the NSEA require that all provincial EAs identify and address the concerns of Aboriginal people regarding the adverse effects or the environmental effects of the proposed undertaking [Sections 9(1A)(xiii)-(xv)]. Furthermore, when formulating an EA decision, the Minister shall consider the concerns expressed by Aboriginal people, the steps taken by the proponent to address those concerns, and existing land use in the area of the undertaking [Sections 12(c), (d), and (g)].

In addition to the above, the federal and/or provincial government may require that EAs for projects proposed in Nova Scotia incorporate traditional and local knowledge gathered through an MEKS undertaken as per the *Mi'kmaq Ecological Study Protocol* ratified by the Assembly of Nova Scotia Mi'kmaq Chiefs on November 22, 2007 (Assembly of Nova Scotia Mi'kmaq Chiefs 2007). An MEKS may be warranted for projects that are of a larger scope; located on Crown land; situated close to First Nations land; located in areas of known high archaeological significance; and/or situated in areas that have particular cultural significance for the Mi'kmaq of Nova Scotia (NSOAA 2011a). An MEKS was conducted for the Maritime Link Project by MGS according to the Protocol.

8.4.1.2 Selection of Environmental Effects and Measurable Parameters

The environmental assessment of current use of land and resources for traditional purposes by the Mi'kmaq is focused on change in current use of land and water resources for traditional purposes by the Mi'kmaq of Nova Scotia.

This environmental effect was selected due to the potential for the Project to alter or otherwise affect areas and resources currently used by the Mi'kmaq people of Nova Scotia for traditional purposes such as hunting, fishing, trapping, gathering, and/or cultural, spiritual, and ceremonial activities. As specified under *CEAA*, the focus of this VEC is on current use of land and resources for traditional purposes, although the MEKS also addresses past use and occupation by the Mi'kmaq of Nova Scotia.

The measurable parameters used for the assessment of the environmental effect presented above, and the rationale for their selection, are provided in Table 8.4.1.

Table 8.4.1 Measurable Parameters for Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia

Environmental Effect	Measurable Parameter	Rationale for Selection of the Measurable Parameter
Change in Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia	• Documented current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia • Project effects on traditional land access • Change in habitat that could affect resource use for traditional purposes. • Potential social and/or economic effects to the Mi'kmaq that may arise as a result of any change in the environment due to the Project.	A key consideration in the assessment of environmental effects of the Project on this VEC is how the land and resources in Cape Breton are currently used by the Mi'kmaq for traditional purposes, including hunting, fishing, trapping, gathering, cultural, spiritual, or ceremonial purposes. *CEAA* requires consideration of potential social and/or economic effects to the Mi'kmaq that may arise as a result of any change in the environment due to the Project. The NS*EA* requires consideration of existing land use in the area of the undertaking as well as consideration of any Mi'kmaq concerns regarding Project effects.

8.4.1.3 Temporal and Spatial Boundaries

The temporal boundaries for the assessment of the potential environmental effects of the Project on current use of land and resources for traditional purposes by the Mi'kmaq include the periods of construction and operation.

The spatial boundaries for the environmental effects assessment of current use of land and resources for traditional purposes by the Mi'kmaq are defined below based on the areas in Cape Breton that were considered in the MEKS for the analysis of traditional use activities.

The Study Area for the Cape Breton segment of the current use of land and resources for traditional purposes by the Mi'kmaq is defined as 500 m-wide area centered on the middle of

the existing transmission corridor between the Point Aconi Generating Station and the Woodbine Substation, including any inland (freshwater) and inshore (marine or estuarine) waters within the 500 m corridor. It covers an area from Point Aconi through Bras d'Or, Leitches Creek, Portage, to the Woodbine Substation. The Study Area also includes any areas in Cape Breton, as well as nearshore marine fishing areas, that are located in the immediate vicinity of the 500 m corridor identified above and were identified in the MEKS as the site of Mi'kmaq traditional use activities. The spatial boundaries of this Study Area are similar to the boundaries of the area referred to in the MEKS as the Project Site, except that this Study Area is generally limited to Cape Breton and excludes the Cabot Strait, apart from the nearshore marine fishing areas described above.

As described in the MEKS, the area used for the assessment of cumulative effects extends five kilometres beyond either side of the Study Area, depending on physical and biological conditions and the type and location of other past, present, and reasonably foreseeable projects.

8.4.1.4 Threshold for Determining the Significance of Residual Environmental Effects

A **significant adverse residual environmental effect** on current use of land and resources for traditional purposes is a Project-related effect that results in a long-term, unmitigated loss of access to, or availability of, resources within the Study Area that are currently used by the Mi'kmaq of Nova Scotia for traditional purposes, such that these lands and resources cannot continue to be used by the Mi'kmaq at current levels for more than one year.

8.4.2 BASELINE CONDITIONS

The information throughout this section relies substantially on the results of the MEKS as well as Mi'kmaq fisheries research completed by UNIR.

The Mi'kmaq have occupied the land and used the resources of Nova Scotia for millennia, long before first European contact in the 16th century (NSMNH 1996b). The earliest evidence of Aboriginal habitation of Mainland Nova Scotia, found at the foot of the south slopes of the Cobequid Mountains at present day Debert, indicates that the area was occupied approximately 11,000 years ago by Paleo-Indian peoples.

At the time of first European contact, the territory of the Mi'kmaq comprised seven traditional political districts scattered across what is now Atlantic Canada and the Gaspé Peninsula in Québec, including Unama'ki (*i.e.,* the Mi'kmaq term for Cape Breton). Prehistoric Mi'kmaq artifacts and archaeological sites dating as far back as the Archaic Period (9,000-2,500 years BP) have been recorded in Cape Breton. These include archaic and prehistoric discoveries at Grand River, Loch Lomond, Little Narrows, Belfry Lake, Fourchu Bay, Framboise Cove, Cow Bay and Mira River.

Section 8.3 contains a further discussion of Mi'kmaq physical and cultural heritage with respect to the archaeological context (*e.g.,* sites historically occupied by Mi'kmaq).

There are five Mi'kmaq communities in Cape Breton: Membertou First Nation, Eskasoni First Nation, Waycobah First Nation, Wagmatcook First Nation, and Potlotek First Nation. An overview of these communities is presented in Table 8.4.2.

Table 8.4.2 Characteristics of Cape Breton Mi'kmaq Communities, 2011

Reserve	Size (ha)	Location	Approximate Distance from Project Area	Total Population as of December 2011 (On and Off-Reserve)
Membertou First Nation				
Membertou #28B	45.2	1.6 km south of Sydney	11.9 km	1,288
Caribou Marsh #29	219.3	8 km southwest of Sydney	6.6 km	
Sydney #28A	5.1	1.6 km northeast of Sydney	10.4 km	
Malagawatch #4 *	132.26	62.4 km southwest of Sydney	51 km	
Eskasoni First Nation				
Eskasoni #3	3,504.6	40 km southwest of Sydney	19.9 km	4,060
Eskasoni #3A	28.5	40 km southwest of Sydney	20.6 km	
Malagawatch #4 *	132.26	62.4 km southwest of Sydney	51 km	
Waycobah First Nation				
Whycocomagh #2	828.5	70.4 km west of Sydney	59 km	943
Malagawatch #4 *	132.26	62.4 km southwest of Sydney	51 km	
Wagmatcook First Nation				
Wagmatcook #1	319.7	51.2 km west of Sydney	40.8 m	761
Margaree #25	8	68.8 km northwest of Sydney	57.8 km	
Malagawatch #4 *	132.26	62.4 km southwest of Sydney	51 km	
Potlotek First Nation				
Chapel Island #5	592.5	68.8 km southwest of Sydney	48.6 km	665
Malagawatch #4 *	132.26	62.4 km southwest of Sydney	51 km	
Malagawatch #4 is 661.3 ha in size, with 20% or 132.26 ha held by each of the following five First Nations: Chapel Island, Membertou, Eskasoni, Wagmatcook, and Waycobah." First Nations bands, rather than reserves, would hold interests in a shared reserve.				

Source: CBU n.d.

Membertou and Eskasoni are the Mi'kmaq First Nations in closest proximity to the Study Area. The nearest two Mi'kmaq Reserves to the Study Area are Caribou Marsh #29 and Membertou #28B, which both belong to the Membertou First Nation and are located approximately 6.5 km and 12 km east of the transmission line corridor, respectively. The next two closest Mi'kmaq Reserves to the Study Area are Eskasoni #3 and #3A, which both belong to the Eskasoni First Nation and are situated approximately 19.3 km and 20.7 km to the west of Woodbine Substation, respectively.

8.4.2.1 Mi'kmaq Ecological Knowledge Study

The Project-specific MEKS identifies Mi'kmaq traditional use activities that have taken place or currently are taking place within the Study Area (referred to as the Project Site in the MEKS) and surrounding area (referred to as the Study Area in the MEKS), as well as any Mi'kmaq traditional ecological knowledge with respect to those areas.

The two main components of the MEKS are:

- a study of past and present Mi'kmaq traditional land and resource use activities (using interviews as the key source of information); and
- a Mi'kmaq species significance analysis identifying resources that are important to Mi'kmaq use.

As a first step to gathering traditional use data, the MEKS team initiated dialogue and correspondence with the five Mi'kmaq First Nations in Cape Breton. Individuals who participate in traditional land use activities, or those who are knowledgeable about the land and resources, were identified and interviews arranged. This MEKS involved 21 interviews and 50 individuals provided information in regards to past and present traditional use activities. All interviewees resided within or were from one of the five aforementioned Mi'kmaq communities in Cape Breton. All of the interviews were completed in accordance with the *Mi'kmaq Ecological Knowledge Study Protocol* (Assembly of Nova Scotia Mi'kmaq Chiefs 2007). In addition to interviews, a combination of desktop research and site visits were also used to identify past and present land and resource uses and features which are of particular importance to the Mi'kmaq people.

The MEKS concluded that the Mi'kmaq have historically undertaken traditional use activities – specifically fishing, hunting, and gathering – in the Study Area and more broadly in Cape Breton, and that these practices have continued, in various locations and at different times of the year, up to the present day. Much of the following information is drawn from the Project-specific MEKS.

The findings of the MEKS indicate that the primary Mi'kmaq traditional use activity that currently takes place in the vicinity of the Project in Cape Breton is fishing, with trout being the most fished species. The Mi'kmaq also fish several other species, including salmon, eel, smelt, capelin, gaspereau, periwinkle, and perch.

Other land and resource uses that were identified as presently or previously occurring include hunting deer, partridge, rabbit, seal, beaver and squirrel, as well as gathering of blueberry, cow lily, golden thread, gooseberry, mint and sweet grass.

After fishing, hunting is the next most common Mi'kmaq traditional use activity that currently takes place in the vicinity of the Project in Cape Breton. Deer and partridge are among the species hunted.

No cultural sites were identified within or adjacent to the Study Area.

Traditional Fishing (Inland, Inshore and Nearshore Marine Waters)

Fishing is an important traditional and commercial activity for the Mi'kmaq, and trout fishing is the most important traditional use activity identified in the MEKS by a considerable margin. In the Study Area, 19 trout fishing areas were identified near Woodbine; along the shore of the Sydney River from Coxheath to Blacketts Lake; along Blacketts Lake to Northside East Bay; in Frenchvale; and in Leitches Creek. Within eastern Cape Breton, 68 trout fishing areas were reported in the following general locations: around French Road; Canoe Lake; in the Mira River from Grand Mira South to Trout Brook; Woodbine; Blacketts Lake from East Bay to Ben Eoin; Sydney Forks area; Frenchvale; along the Northwest Arm from North Sydney to Leitches Creek; and Scotch Lake to Georges River.

Inshore and nearshore lobster fishing areas were noted, around Bras d'Or; in waters from Cape Dauphin, to New Campbellton, to Point Aconi; and in the Northwest Arm of Sydney Harbour from Balls Creek to Sydney Mines. With the exception of one lobster fishing area in the Study Area, all of the lobster fishing areas identified by MEKS interviewees were described as being used primarily for commercial fishing purposes. MEKS interviewees also indicated that almost all of the identified lobster fishing areas are currently fished by Mi'kmaq.

After trout, lobster and salmon are the most commonly fished species in the Study Area, closely followed by mackerel. Eel (including juvenile eels) is also fished in the Study Area but less frequently than trout, lobster and salmon. Salmon fishing was identified in five areas in the Mira River and around Marion Bridge. Mackerel fishing areas were reported in the Mira River around Marion Bridge.

Within eastern Cape Breton, the second most commonly fished species after trout is eel, with eel fishing areas identified along the Mira River from Grand Mira South to Trout Brook; in Blacketts Lake, near East Bay; in Sydney River from Sydney Forks to near Howie Centre; near Leitches Creek; and around the Northwest Arm from Balls Creek to North Sydney.

Smelt, capelin, gaspereau, periwinkle, and perch were also identified as species that are fished, but not as commonly as the aforementioned species. Other species mentioned by informants as traditionally being fished, albeit to a lesser degree than trout and eel, are salmon, oyster, clam, flounder, white sucker, mussel, rock crab and shad.

According to MEKS interviewees, the timeline classifications for the aforementioned fishing activities within the Study Area are almost equally divided between "current use" (*i.e*., occurring within the last 10 years), "recent past" (*i.e.,* occurring 11-25 years ago), and "historic past" (*i.e.*, occurring more than 25 years ago). Mi'kmaq fishing activity within wider eastern Cape Breton was primarily classified as recent past by a small majority. Also by a slight margin, the second most common timeline classification reported for Mi'kmaq fishing activity was current use, followed closely by recent past. MEKS interviewees also noted several areas that have been in continuous use since at least the 1980s.

The majority of fishing areas identified in the Study Area were classified as harvest fisheries, although commercial fisheries are also represented.

Traditional Hunting

Current Mi'kmaq hunting activities were reported for eastern Cape Breton, including the Study Area.

In the Study Area, partridge hunting was described as taking place in two areas from French Road to Marion Bridge; and from Leitches Creek to Georges River to Mill Creek. A third hunting area (for deer) was also identified around the Woodbine area. Other species hunted in the Study Area include beaver, muskrat, rabbit, seal, and squirrel. All of these hunting activities were described as occurring currently, with one deer hunting area reported to be used continuously since 1970.

The MEKS findings suggest that hunting in general, and deer hunting in particular, is a more popular activity in areas outside of the Study Area. Ten deer hunting areas were identified in an area from Grand Mira South to Juniper Mountain to Trout Brook; around MacAulay Lake; between Beechmont, Beechmont North, and Blacketts Lake; and from Leitches Creek area, to Scotch Lake, to Bras d'Or, to Alder Point and McCreadyville.

Partridge hunting was noted in six areas from Grand Mira South to Juniper Mountain to Trout Brook; around MacAuley Lake; around Caribou Marsh reserve, including Dutch Brook, Caribou Marsh and Meadows Road; and from Upper Leitches Creek and Barachois to Florence, Alder Point and Millville.

Other species reported hunted by informants, but to a relatively lesser degree than the ones described above, are rabbit, seal, beaver, duck, muskrat, and squirrel.

The reported hunting areas were apportioned among the three timelines as follows: current use (51%), recent past (23%) and historic past (26%)

Traditional Gathering

The region encompassing Glen Morrison, Woodbine and Marion Bridge is the only part of the Study Area in which traditional gathering activities were described as having taken place. Cow lily gathering was recorded at five separate areas within that vicinity, and gathering of alder, birch trees, blueberry, golden thread, gooseberry, mint, poplar, striped maple, and sweet grass was also mentioned as occurring in the area. MEKS interviewees indicated that the majority of these gathering activities (58%) were performed in the historic past, and that the remaining 42% constitutes current gathering activity within the Study Area.

Cranberry picking was the most prevalent gathering activity identified, reportedly occurring in five distinct areas located in the vicinity of North Sydney.

After cranberry, blueberry and cow lily are the next most commonly gathered species. Three blueberry gathering areas were mentioned in areas around Marion Bridge and Juniper Mountain as well as around North Sydney. Cow lily gathering was identified in three areas, all within the general vicinity of Woodbine.

Other species gathered to a relatively lesser degree are raspberry, sweet grass, alder, birch, blackberry, golden thread, gooseberry, mayflower, mint, poplar, strawberry and striped maple.

With respect to timeline classifications, 42% of the gathering areas were described by MEKS interviewees as being used in the historic past, 31% as current use and 26% as recent past

Summary of Traditional Resource Use

During field visits carried out in support of the MEKS, the following plant species of potential importance to the Mi'kmaq were noted throughout the Study Area: clover, sage, cat tail, mayflower, Labrador tea, raspberry, blueberry, strawberry, bayberry, blackberry, bunchberry, cranberry, and snowberry. Trees found throughout the Study Area include apple, alder, cherry, birch (white/yellow), spruce (white), beech, maple and striped maple, poplar, fir, and tamarack. Habitat areas and signs of deer, beaver and rabbit were also visible throughout the Study Area.

The MEKS identified several resources and land/water areas that continue to be used by Mi'kmaq to varying degrees (Table 8.4.3). This listing includes nearshore fishing activities in the Cabot Strait.

Table 8.4.3 Resources/Areas of Traditional Importance to the Mi'kmaq in eastern Cape Breton near the Study Area

Type of Use	Number of Areas	Number of Resources
Food/Sustenance	241	43
Medicinal/Ceremonial	24	15
Tools/Art	7	6

The eastern Cape Breton population of Atlantic salmon is designated as endangered by COSEWIC and the Nova Scotia populations of American eel are designated threatened by COSEWIC. SOCI are addressed in Section 8.1. With the exception of these two fish species, none of the other species identified by interviewees within the area are rare. All other species of plants and animals identified by MEKS interviewees are considered common and abundant throughout Nova Scotia.

8.4.2.2 Mi'kmaq Fisheries of Unama'ki

The UINR background report identified current fisheries undertaken by the Mi'kmaq of Unama'ki (Cape Breton). Associated research consisted of a literature review and compilation of Mi'kmaq ecological knowledge gathered through 17 interviews with Mi'kmaq commercial fish harvesters, and Mi'kmaq traditional fish harvesters who fish for food, social, and ceremonial purposes.

The following excerpt from the UINR report provides some context regarding the different types of Mi'kmaq fisheries (*i.e.*, commercial and traditional) and their organization:

> *The Mi'kmaq fish for a diversity of species commercially and for traditional purposes around Nova Scotia. Recently acquired (2000) commercial access is in two [DFO] management areas of the Maritimes and the Gulf Regions as a result of the recognition of the Mi'kmaq Right and Title to aquatic resources for a moderate livelihood by the Supreme Court of Canada. These licenses are known as commercial communal. The licences are not individually owned but belong to the community governed by the Chief and Council. Each community designates a commercial fishing department who manages the daily activities of fishing fleets. Revenues are reinvested in the community. There are, however, several individuals with personal licenses and who benefit entirely from revenues generated through fishing activities. Revenues from commercial access comprise a significant portion of Band revenues and create the majority of employment opportunities for the community in the fishing sector and as administrative and field support.*
>
> *The most diverse fishery, however, is the Mi'kmaq traditional fishery. While little diversity current exists for the commercial fishing industry in the region, there are many more species that are relied upon by the Mi'kmaq for food, social and ceremonial requirements. Many of these species are fished under agreements known as Aboriginal Fisheries Strateg[ies] (AFS) between communities and [DFO]. Agreements vary by community.*

Fishing seasons for commercial purposes are set by DFO. They are specific and rarely vary between years, whereas harvest times for food, social and ceremonial species can vary depending on need (*e.g.*, personal consumption, ceremonies, feasts, wakes, *etc.*) and availability. In general, Mi'kmaq fishing within the Study Area occurs year-round, with the greatest diversity of fisheries occurring in the spring and summer months, and the lowest diversity during the fall and winter.

Twenty-three fish species and six invertebrate species were identified by interviewees as species harvested for food, social, and ceremonial purposes by the Mi'kmaq of Nova Scotia, including trout, lobster, eel, salmon, gaspereau, rainbow smelt, and striped bass.

Similar to the results of the MEKS undertaken by MGS, UINR's findings also identify trout as the most fished species on Cape Breton. Trout fishing was mentioned by informants six times in the areas of Marion Bridge, the Mira River, Juniper Mountain, and the surrounding brooks and streams; in various lakes, brooks, and streams in the areas of Frenchvale, Leitches Creek, Balls Creek, and Pottle Lake; and around Bras d'Or and Little Bras d'Or. Species identified to a lesser degree include eel, salmon, smelt, capelin, gaspereau, and striped bass.

According to the UINR report, the majority (60%) of all fishing activities by Mi'kmaq of Cape Breton were characterized by interviewees as current use activities, with the remainder classified equally as recent past use (20%) and historic past use (20%). Furthermore, the

majority (54%) of fishing areas were categorized by interviewees as primarily for harvesting purposes, with 26% described as areas fished for commercial purposes and 20% identified as serving other purposes, including spawning areas and overwintering areas.

8.4.3 POTENTIAL PROJECT-VEC INTERACTIONS AND ENVIRONMENTAL EFFECTS

8.4.3.1 Potential Project-VEC Interactions

Table 8.4.4 ranks for each Project activity the potential effects on current use of land and resources by the Mi'kmaq of Nova Scotia as 0, 1 or 2 based on the level of interaction with the Project and the degree of environmental effect

Table 8.4.4 Potential Project Environmental Effects on the Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia

Project Activities and Physical Works	Potential Environmental Effects
	Change in Land and Resource Use for Traditional Purposes by the Mi'kmaq
Construction	
Site Access and Site Preparation	2
Transmission and Grounding Line Infrastructure	2
Converter Stations	2
Grounding Facilities	2
Operation	
Overland Power Transmission	2
Power Conversion	1
Maintenance	
Regular Inspection	1
Repair to Infrastructure	1
Vegetation Management	2

KEY
0 = No interaction
1 = Interaction occurs; however, based on past experience and professional judgment, the resulting effect can be managed to acceptable levels through standard operating practices and/or through the application of best management or codified practices. No further assessment is warranted.
2 = Interaction occurs, and resulting effect may exceed acceptable levels without implementation of specified mitigation. Further assessment is warranted.

No Project activities during the construction phase received a ranking of 0 or 1 in Table 8.4.4.

No Project activities during the operational phase received a ranking of 0 in Table 8.4.4

As indicated by the ranking of 1 in Table 8.4.4, regular inspection and repair to infrastructure during the maintenance phase of the Project have the potential to interact with current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia; however, the resulting environmental effects are not anticipated to be significant. Inspection of infrastructure using aircraft, ATVs and/or snowmobiles is not expected to substantially interfere with Mi'kmaq

access to lands or resources, as associated activities will be temporary, highly localized, and will only be carried out occasionally (*i.e.*, on an as-needed basis). Potential effects on land/water and natural resources (*e.g.,* species or habitats) of traditional importance to Mi'kmaq will be minimized through efforts to have maintenance vehicles avoid previously undisturbed areas when accessing the site. Existing roads, trails, cleared areas, and other previously disturbed areas will be used wherever feasible when vehicle access is required. Power conversion is also rated as 1 for potential environmental effects on the current use of land and resources for traditional purposes. Power conversion requires infrastructure and buildings which, although they represent a very small proportion of land and resources available, may displace current activities at the converter station and grounding site locations. Potential effects of emissions associated with power conversion are assessed in the Marine Environment VEC (Section 7.3).

In consideration of the nature of the interactions and the planned implementation of proven mitigation, the potential environmental effects of infrastructure maintenance on current use of land and resources for traditional purposes during any phase of the Project are rated not significant, and are not considered further in the assessment.

As indicated by the rankings of 2 in Table 8.4.4, the following Project activities may interact with the current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia in such a way that, if unmitigated, could lead to significant environmental effects:

- site preparation;
- transmission and grounding line infrastructure;
- converter stations;
- grounding facilities;
- power transmission; and
- vegetation management.

Potential interactions between the above-listed Project activities/components and the VEC require further evaluation and are therefore assessed in the following sections.

8.4.3.2 Potential Environmental Effects

Project construction activities have potential to affect Mi'kmaq land and resource use for current and future generations. Potential Project-related changes in terrestrial and aquatic habitats could affect traditional land/water use by the Mi'kmaq of Nova Scotia. Restricted access to the Project site during construction could constrain Mi'kmaq fishing, hunting, and harvesting opportunities. During operation and maintenance, the presence of infrastructure associated with the Project and ongoing vegetation management activities could similarly restrict Mi'kmaq fishing, hunting, and harvesting opportunities.

Potential effects of any Project-induced change in the environment on archaeological and heritage resources in the Study Area are assessed in Section 8.3.

Construction

Site Preparation will involve clearing and grubbing of vegetation, potentially including removal or destruction of resources (*e.g.*, species or habitats) of traditional importance to Mi'kmaq. Construction access roads, watercourse crossings (where required), and temporary facilities in support of site preparation similarly have potential to result in removal or destruction of such resources. This is likewise the case for construction activities associated with transmission and grounding line infrastructure, including excavation/filling/blasting as required for construction of tower foundations. Construction and installation of permanent facilities on land will require clearing and grubbing, as well as construction of converter stations and transition compounds, and trenching and installation of underground cables, all of which may also entail removal or loss of natural resources of traditional importance to the Mi'kmaq of Nova Scotia.

General construction activity will temporarily restrict access to the area, thereby obstructing Mi'kmaq use of the land and resources.

Watercourses and nearshore marine waters within the Study Area may be inhabited by fish species of traditional importance to the Mi'kmaq of Nova Scotia, such as trout, eel, lobster, salmon, perch and white sucker. As noted above, trout fishing was identified through the MEKS as the most important Mi'kmaq traditional use activity that currently takes place in the Study Area, and American eel is traditionally fished by the Mi'kmaq in Cape Breton and is designated as threatened by COSEWIC. The eastern Cape Breton population of Atlantic salmon is designated as endangered by COSEWIC. Potential Project-related disturbances to SOCI are described in Section 8.1. Project-related interference with the inshore commercial lobster fishery could result in a loss or reduction of income for some Mi'kmaq (discussed further in Section 7.4).

Operation and Maintenance

The presence of facilities during operation will occupy land that otherwise potentially could have been used for traditional purposes by the Mi'kmaq of Nova Scotia. Public access to certain areas (*e.g.,* converter stations) will be restricted during operation for safety and security reasons.

Vegetation management will include cutting trees and shrubs as well as selective herbicide use along the transmission corridor and at Project-related facilities. These activities could adversely affect plant species of traditional importance to the Mi'kmaq of Nova Scotia, such as cow lily, cranberry and blueberry which, as the MEKS indicated, are currently gathered within the region. Furthermore, unmitigated application of herbicides could potentially affect downstream water quality and associated fish and fish habitat, possibly to the detriment of fish species currently fished by the Mi'kmaq of Nova Scotia.

8.4.4 MITIGATION OF PROJECT ENVIRONMENTAL EFFECTS

Potential adverse Project effects on current use of land and resources by Mi'kmaq of Nova Scotia will be mitigated through implementation of the recommendation stated in the Project-specific MEKS report: "the traditional use activities of the Mi'kmaq [will] be reflected upon in the overall environmental presentation".

As summarized below, additional mitigation measures proposed for the Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq VEC are broadly the same as those prescribed for other related VECs:

- Project effects on inshore and freshwater Mi'kmaq fisheries will be reduced through implementation of the mitigation and compensation measures outlined for the Commercial Fisheries VEC (Section 7.2), Marine Environment VEC (Section 7. 3), and Socio-economic Environment VEC (Section 8.2);

- mitigation carried out in support of the biophysical environment (*i.e.*, SOCI VEC) will protect habitats and species of traditional importance to the Mi'kmaq (Section 8.1);

- potential Project-related restrictions on Mi'kmaq land access will be addressed through implementation of the mitigation measures outlined for the Socio-economic Environment VEC (Section 8.2); and

- the mitigation measures proposed for the Archaeological and Heritage Resources VEC (Section 8.3) will minimize potential Project effects on sites or artifacts of archaeological or heritage importance to Mi'kmaq.

8.4.5 CHARACTERIZATION OF RESIDUAL PROJECT ENVIRONMENTAL EFFECTS

8.4.5.1 Construction

Even with the application of mitigation measures, there may be effects on some traditionally important species and/or habitats as a result of direct and indirect environmental effects associated with Project construction. In addition, site restrictions during construction will result in a temporary loss of access for traditional Mi'kmaq use, while land development and construction of Project infrastructure (*e.g.*, secure facilities) will potentially lead to permanent loss of land and resources that otherwise potentially could have been used for traditional purposes by the Mi'kmaq of Nova Scotia.

With the exception of American eel and Atlantic salmon, all other plant and animal species identified in the MEKS as valuable for Mi'kmaq use are considered common and abundant throughout Nova Scotia. As noted previously, American eel is considered threatened by COSEWIC and Atlantic salmon is considered an endangered species in Nova Scotia. Inshore and freshwater fishing of eel and salmon is known to occur within the Study Area and surrounding region. There may be unrecorded Mi'kmaq eel and salmon fishing occurring within

the Study Area presently, and it is also possible that fishing for eel and salmon could occur in inshore and freshwater areas in the future, depending on species availability and interests. The Mi'kmaq could still rely on these species for sustenance and cultural ceremonies, and disturbances to eel and salmon habitat could therefore adversely affect Mi'kmaq use.

Inshore and freshwater trout fishing is an activity that was repeatedly noted during the interview process as occurring from the historic past through to present day. Several areas traditionally used for commercial inshore lobster fishing were also identified by MEKS interviewees. As such, trout and inshore lobster fishing are important activities undertaken by the Mi'kmaq of Nova Scotia within the region that could be adversely affected by potential Project-related disturbances.

Potential environmental effects on fish, fish habitat, and commercial fishing activity could disrupt Mi'kmaq traditional use activities as well as compromise an important source of income for the Mi'kmaq, thus having adverse socio-economic effects. However, it is anticipated that several alternative inshore and freshwater fishing areas – including inshore and freshwater trout, lobster, eel, and salmon fishing areas – are available for Mi'kmaq use in the general vicinity of the Study Area. Furthermore, where required, habitat compensation will be implemented to achieve no net loss in the productive capacity of fish habitat. These compensation projects will be executed as close to the Study Area as feasible to minimize potential effects of habitat loss on local Mi'kmaq fish harvesters.

With regards to Mi'kmaq use of plants and animals within and near the Study Area, deer and blueberry are still used by some Mi'kmaq as a means of sustenance. The presence of blueberries within the Study Area was confirmed during a field visit conducted in support of the MEKS. Other plant species that were identified by MEKS interviewees as resources for traditional gathering and that were observed within the Study Area include cranberry, blueberry, raspberry, strawberry, blackberry, mayflower, alder, birch, poplar and striped maple. Habitat areas and signs of deer, beaver and rabbit – animal species reported in the MEKS as being hunted– were also visible throughout the Study Area. There is therefore potential for current and future gathering or hunting activities to occur within the Study Area, depending on availability and interests. A certain degree of residual Project-related interference with potential gathering and hunting activities within the transmission corridor may be unavoidable for a short period during construction. However, since most of the resources in question are common and abundant throughout Nova Scotia, alternative areas should be readily available.

Traditional Mi'kmaq land use will be affected by access restrictions during construction of the power transmission line. However, construction activities and associated access restrictions within the expanded transmission corridor will be temporary, and the operation of the transmission line and associated infrastructure will not substantively restrict land use in the surrounding area. Therefore, it is expected that the pre-Project level of public access will be restored following construction and that Mi'kmaq use of the land and resources in the transmission corridor can continue thereafter, albeit subject to certain terms and conditions related to landowner permission. It is likely that access along some currently undeveloped and

overgrown sections of the transmission corridor will improve after the corridor is cleared for installation of the transmission line.

8.4.5.2 Operation and Maintenance

During operation, Project infrastructure and site access restrictions in some very localized areas (*e.g.*, secure facilities) will preclude Mi'kmaq use of that land and associated resources for traditional purposes. However, the land occupied for Project facilities will represent a very small proportion of land and resources available for Mi'kmaq use in the surrounding area.

Like other residents of Cape Breton and Nova Scotia in general, it is expected that the Mi'kmaq will be positively affected by socio-economic benefits associated with Project-related expenditures and economic spinoffs, as well as potential employment, recruitment, and training initiatives during all phases of the Project.

8.4.6 SUMMARY OF RESIDUAL ENVIRONMENTAL EFFECTS

A summary of the environmental effects assessment and prediction of residual environmental effects resulting from interactions ranked as 2 on current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia is provided in Table 8.4.5. Only the interactions ranked as 2 were considered further in the assessment of Project related environmental effects. All other interactions previously ranked as 0 or 1 were rated as not significant.

Table 8.4.5 Summary of Project Residual Environmental Effects: Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia

CHANGE IN CURRENT USE OF LAND AND WATER RESOURCES FOR TRADITIONAL PURPOSES BY THE MI'KMAQ OF NOVA SCOTIA								
Mitigation –Construction, Operation and Matintenance								
• As recommended in the Project-specific MEKS report, "the traditional use activities of the Mi'kmaq [will] be reflected upon in the overall environmental presentation". • Mitigation measures associated with the following VECs will be implemented: o Commercial Fisheries (Section 7.2); o SOCI(Section 8.1); o Socio-economic Environment (Section 8.2); and o Archaeological and Heritage Resources (Section 8.3).								
Assessment								
Construction	**Residual Environmental Effects Characteristics**							
	Direction	**Magnitude**	**Extent**	**Duration**	**Frequency**	**Reversibility**	**Environmental Context**	**Significance**
	Adverse	Moderate	Local	Short term / Long term	Occasionally	Reversible / Irreversible	Undisturbed	Not Significant

Table 8.4.5 Summary of Project Residual Environmental Effects: Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia

CHANGE IN CURRENT USE OF LAND AND WATER RESOURCES FOR TRADITIONAL PURPOSES BY THE MI'KMAQ OF NOVA SCOTIA								
Operations	Adverse	Moderate	Local	Long term	Occasionally / Continuous	Reversible	Undisturbed	Not Significant
Follow-up								
• Upon final selection of the grounding facility location the MEKS will be amended to further characterize the sites.								

KEY

Direction:
Positive.
Adverse.

Magnitude:
Negligible: no measurable adverse effects anticipated.
Low: no net loss in the availability of or access to land and/or resources currently used for traditional purposes by the Mi'kmaq.
Moderate: a nominal loss, or substantive loss that is compensated, in the availability of or access to land and/or resources currently used for traditional purposes by the Mi'kmaq.
High: a non-compensated substantive and permanent loss in the availability of or access to land and/or resources currently used for traditional purposes by the Mi'kmaq

Geographic Extent:
Local: within the Study Area.
Regional: within eastern Cape Breton

Duration:
Use quantitative measure; or
Short term: During the Project Phase.
Medium term: Duration of the Project.
Long term: Duration of the Project plus 10 years.
Permanent: Will not change back to original condition.

Frequency:
Occasionally, once per month or less.
Occurs sporadically at irregular intervals.
Occurs on a regular basis and at regular intervals.
Continuous.

Reversibility:
Reversible.
Irreversible.

Environmental Context:
Undisturbed: Area relatively or not adversely affected by human activity; includes Area of New Access.
Developed: Area has been substantially previously disturbed by human development or human development is still present.
N/A Not Applicable.

Significance:
Significant.
Not Significant.

8.4.7 CUMULATIVE ENVIRONMENTAL EFFECTS

In addition to the assessment of Project-related environmental effects presented above, an assessment of cumulative environmental effects was conducted in regard to other projects and activities that have potential to interact with the Project. For the Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq VEC, the assessment area for cumulative environmental effects comprises the area within five km of the Study Area. In large measure, the effects of past and existing projects are reflected in the baseline conditions against which the Project is being assessed. Table 8.4.6 identifies the potential for overlap between the Project residual environmental effects and those of other current projects or activities for which modifications or expansions are planned or underway, and future projects that can reasonably

be predicted, within the assessment area. Table 8.4.6 also ranks the potential cumulative environmental effects as 0, 1, or 2 based on the degree of interaction with other projects or activities and the potential for overlapping effects with the Project.

Table 8.4.6 Potential Cumulative Environmental Effects on Current Use of Land and Resources for Traditional Purposes by the Mi'kmaq of Nova Scotia

Other Projects and Activities with Potential for Cumulative Environmental Effects	Potential Cumulative Environmental Effects
	Change in Current Use of Land and Resources for Traditional Purposes
Port of Sydney Dredging and Infilling (includes PEV)	1
Donkin Export Coking Coal Project	1
Existing Linear Facilities	1
Existing Residential and Recreational Land Use	1
Resource Land Use	1

KEY
0 = Project environmental effects do not act cumulatively with those of other projects and activities.
1 = Project environmental effects act cumulatively with those of other projects and activities, but the resulting cumulative effects are unlikely to exceed acceptable levels with the application of best management or codified practices.
2 = Project environmental effects act cumulatively with those of other projects and activities and the resulting cumulative effects may exceed acceptable levels without implementation of project-specific or regional mitigation.

Potential Project-related effects on Mi'kmaq access to inshore fishing areas and fish habitat could overlap with similar effects from other projects in eastern Cape Breton. Channel dredging in Sydney Harbour (approximately 25 km from the Maritime Link Project) was completed early in 2012, and fish habitat compensation was implemented. Dredging and infilling for the PEV project is planned for late 2012 and also includes fish habitat compensation. Both projects were subject to federal and provincial environmental assessments which concluded that significant residual environmental effects were not likely.

The channel dredging and infilling activities in Sydney Harbour resulted in temporary disruption to traditional fishing activities as well as temporary alteration and permanent loss of fish habitat. These effects were mitigated through fisheries consultation, employment of local fish harvesters to capture and relocate select fish species prior to dredging, and implementation of a substantial fish habitat compensation program. Similar potential cumulative interactions and mitigation measures are anticipated for future proposed dredging and infilling in the South Arm of Sydney Harbour. No traditional Mi'kmaq activities were identified in the MEKS as taking place within the South Arm; however, it is understood that Mi'kmaq food, social and ceremonial fisheries can potentially take place throughout Sydney Harbour and the nearshore waters of Cape Breton.

The Donkin Export Coking Coal project may result in residual changes (including access) to current use of land and resources for traditional purposes by the Mi'kmaq. In particular there will be interaction with the marine environment and fisheries in the Donkin area through the development and operation of a barge load-out and trans-shipment facility. This will result in a loss of access to fishing grounds for traditional fish harvesters. This loss of access will be mitigated by the Donkin proponent. There could be minor cumulative effects due to loss of access for traditional uses to portions of the Donkin headland and areas to be used for Maritime

Link facilities (*e.g.*, grounding facilities and converter station). The MEKS for the Donkin project did not identify the headland as an area currently used for traditional purposes, which reduces the potential for cumulative effects.

Project-related changes to access and availability of land and resources of traditional importance to the Mi'kmaq, including traditional Mi'kmaq fishing areas, will be long-lasting and have potential to overlap with similar effects from other sources within eastern Cape Breton. In particular, historical coal mining and remediation activities, and ongoing fishing activity, have potential to interact cumulatively with the Project to affect current use of land and resources for traditional purposes. However, as indicated by the ranking of 1 in Table 8.4.6, the resulting cumulative effects are unlikely to exceed acceptable levels with the application of best management or codified practices.

Past and present habitat effects associated with existing linear facilities in eastern Cape Breton have potential to interact cumulatively with the Project to adversely affect wildlife and fish species that are traditionally hunted or harvested by the Mi'kmaq. Linear features, such as roads, highways, railroads, and utility corridors contribute to habitat loss, fragmentation of forest habitats and the promotion of adverse edge effects. At the same time, roads and transmission lines provide conduits for humans to enter relatively undisturbed habitats, thereby improving Mi'kmaq access to land and water resources for traditional hunting, fishing, and gathering purposes. The risk of habitat fragmentation and increased access are reduced to the extent that new infrastructure will be incorporated within, or run parallel with, existing developed corridors.

Roads cause more fragmentation and disturbance to wildlife than transmission corridors since they are largely devoid of cover and support vehicular traffic. Transmission lines are maintained in a semi-natural state and there is little ongoing human activity at these sites to dissuade wildlife from crossing them. However, maintenance of transmission lines (*i.e.*, periodic mechanical clearing and application of herbicide), can disturb wildlife and make the transmission corridors less attractive as habitat for some species due to the loss of vegetation cover.

Potential fragmentation of fish habitat associated with linear development is mitigated through construction of fish passage structures, *e.g*., culverts, at road and highway watercourse crossings. These structures are installed and maintained in compliance with the terms and conditions of a provincial Watercourse Alteration Approval, as well as federal and provincial construction specifications and operational statements. Transmission lines typically span watercourses without the need for in-water work, thereby avoiding potential direct effects on fish, fish habitat, and fish passage. In addition, ENL will follow internal protocols (currently used by NSPI) designed to protect freshwater resources crossed by their power lines, including during clearing activities and regular maintenance.

The Project will follow an existing transmission corridor between Point Aconi Generating Station and Woodbine, and an existing road RoW to the grounding facility. This will reduce potential cumulative habitat loss, fragmentation, edge effects, and associated impacts to Mi'kmaq

land/water and resource users. Some traditional Mi'kmaq game species, such as deer, prefer edge habitat where they can graze in cleared areas and take shelter in adjacent forest.

Over time, residential and recreational land use in eastern Cape Breton may have encroached on lands and waters that otherwise could have been used by the Mi'kmaq for traditional purposes. Housing and cottage development could also result in loss of access to traditional hunting, fishing, and harvesting areas and loss or alteration of habitats of traditionally important species. These potential effects have potential to be amplified due to overlap with similar effects associated with Project-related activities and infrastructure. However, the total area disturbed through a combination of existing residential and recreational land use and Project- related infrastructure, will still be minimal relative to the proportion of land and water resources available for Mi'kmaq use throughout eastern Cape Breton.

Trails intended for recreational use support ATV and other traffic that can disturb wildlife habitat important to the Mi'kmaq, and this effect can overlap cumulatively with similar use of new transmission corridors, where permitted. However, such trails and corridors can also provide better access for the Mi'kmaq to forested areas to improve resource exploitation.

Resource land use, including forestry, agriculture, and small-scale quarries, has potential to interact cumulatively with the Project to further constrain traditional Mi'kmaq fishing, hunting and harvesting opportunities. Although industrial forestry activity is not prevalent in eastern Cape Breton, small-scale harvesting in private woodlots does occur. Potential forestry-related cumulative effects on Mi'kmaq land and resource use will, in essence, be mitigated through compliance with provincial forestry policy and regulations (including restrictions on clear cutting) and by the natural regeneration of harvested areas.

In general, governments are obliged to consult with the Mi'kmaq regarding Crown decisions that could affect their constitutional rights for resource harvesting; this will further reduce the opportunity for adverse cumulative effects on current use for traditional purposes. Therefore, overlapping residual environmental effects with the current Project are possible but not considered likely, with the application of mitigation and compliance with legislation.

8.4.8 DETERMINATION OF SIGNIFICANCE

Construction, operation and maintenance activities for the Project may result in adverse effects which could result in a change in current use of land and water resources for traditional use by the Mi'kmaq which could persist over the life of the Project. The change in current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia is attributable to direct and indirect disturbance/loss of land and water resources, and access restrictions. With the implementation of proposed mitigation and environmental protection measures, including the recommendation specified in the MEKS report (*i.e.*, consideration of Mi'kmaq interests and traditional use activities throughout the environmental planning process), the environmental effect of a change in current use of land and water resources for traditional purposes by the Mi'kmaq is predicted to be not significant. Ongoing engagement with Mi'kmaq representatives

will provide feedback on the effectiveness of the mitigation and determine the reliability of the prediction.

The assessment of cumulative environmental effects presented above, combined with the proposed mitigation measures, lead to the conclusion that the residual cumulative environmental effect of a change in current use of land and water resources for traditional purposes by the Mi'kmaq of Nova Scotia is rated not significant.

In summary, residual environmental effects and cumulative effects on the current use of land and resources for traditional purposes by the Mi'kmaq of Nova Scotia are rated not significant.

8.4.9 FOLLOW-UP AND MONITORING

Upon final selection of the grounding facility location the MEKS will be amended to further characterize the sites.

With the implementation of proposed mitigation described for the Current Use of Lands and Resources for Traditional Purposes by the Mi'kmaq VEC, and in consideration of the residual environmental effects rating criteria, no additional monitoring is planned at this time. Additional work and/or monitoring may be required pending the results of mitigation required for the Project.