NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 4
Effects of the Environment on the Project

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LIST OF ACRONYMS

Acronym	Description
°C	degrees Celsius
%	percent
CH_4	methane
cm	centimetre
CO_2	carbon dioxide
DFA	Department of Fisheries and Aquaculture
DFO	Fisheries and Oceans Canada
EIS	Environmental Impact Statement
ha	hectare
HDD	Horizontal Directional Drill
IEC	International Electrotechnical Commission
km	kilometre
km/h	kilometres per hour
m	metre
m/s	metre per second
N_2O	nitrous oxide
NBCC	National Building Code of Canada
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
NRCan	Natural Resources Canada
OHGW	Overhead Groundwire
OPGW	Optical Overhead Groundwire
PIM	Passive Ice Meters
Project	Labrador-Island Transmission Link
ROW	right-of-way
TL	Transmission Line (when referring to specific line number)

4 EFFECTS OF ENVIRONMENT ON THE PROJECT

This chapter assesses effects that may occur as a result of the environment acting on the Labrador-Island Transmission Link (Project). The *Environmental Impact Statement Guidelines and Scoping Document* for the Project, issued by the Government of Newfoundland and Labrador and the Government of Canada in May 2011 (Government of Newfoundland and Labrador and Government of Canada 2011), also states that environmental changes and hazards that may affect the Project are to be described in the EIS. The environmental conditions and events that might affect the Project, and the potential effects of these conditions or events on Project design, Construction, and Operations and Maintenance are presented. These effects are predicted and described in this section.

For over 50 years, Nalcor Energy (Nalcor) and its subsidiaries have been building, operating and maintaining electricity generation and transmission projects within the Newfoundland and Labrador environment. Throughout Project planning and design, Nalcor drew on its own experience, historical data, published literature and industry standards to design a Project capable of withstanding anticipated environmental conditions.

A comprehensive study was undertaken to determine the preferred transmission corridor. This determination required balancing several, often competing, criteria, including line length, terrain, access, exposure to ice and wind, technical criteria and other environmental considerations. In general, the objective was to select the shortest corridor that avoids or limits conflict with environmental sensitivities and crosses terrain where Project Construction is technically feasible. This chapter describes the known and anticipated environmental conditions that may affect the Project and how these conditions influenced Project design.

An environmental condition is considered to have a potential effect on the Project if it may result in one or more of the following:

- harm to Project personnel or the public;
- substantial delay in Construction (i.e., more than one season);
- long-term interruption in service (i.e., more than one week);
- damage to infrastructure;
- threat to public safety; and
- damage to infrastructure to the extent that repair is not economically or technically feasible.

Historical data, computer modelling and published literature were used to characterize the environmental conditions that may affect the Project. Engineering specifications and design loads were determined based on historical, current and anticipated environmental conditions. Safety, durability and corrosion resistance throughout the life of the Project were considered during material selection. Environmental conditions that either affected Project design or have the potential to affect Project Construction, and Operations and Maintenance, include:

- vegetation;
- lightning;
- forest fire;
- wind, freezing precipitation and ice accretion;
- salt spray;
- bathymetry;
- currents and tides;

- waves;
- sea ice and icebergs;
- seismicity;
- climate change;
- land and resource use; and
- fisheries.

4.1 Biophysical Environment

4.1.1 Vegetation

4.1.1.1 Environmental Conditions

The transmission corridor crosses ten distinct ecoregions, four in Labrador and six in Newfoundland. Each ecoregion can be characterized by its predominant vegetation type, including forest, bog and fen, barren, coastal and highland.

Approximately half of the Labrador transmission corridor lies within the Low Subarctic Forest (Mecatina River) Ecoregion. The most common habitat types crossed by the transmission corridor in Labrador include Open Conifer Forest, Conifer Forest, Conifer Scrub and Wetland, each occupying less than a third of the total area. Uncommon habitat types include Spruce Lichen Forest, Burn, Hardwood Forest and Mixedwood Forest.

Approximately half of the transmission corridor in the Northern Peninsula of Newfoundland lies within the Northern Peninsula Forest Ecoregion, and approximately a third lies within the Long Range Barrens Ecoregion. The dominant habitat types crossed by the transmission corridor within the Northern Peninsula region include Conifer Forest, Scrub / Heathland / Wetland Complex and Open Conifer Forest. Uncommon habitat types crossed by this portion of the transmission corridor include Alpine Vegetated, Conifer Scrub, Kalmia Lichen / Heathland and Rocky Barrens.

Almost all of the Central and Eastern Newfoundland portion of the transmission corridor is located within the Central Newfoundland Forest Ecoregion. The most common habitat type crossed by the transmission corridor is Mixedwood Forest. Uncommon habitat types include Conifer Scrub, Kalmia Lichen / Heathland and Rocky Barrens.

Most of the Avalon Peninsula portion of the transmission corridor is located within the Maritime Barrens Ecoregion. Scrub / Heathland / Wetland Complex is the most common habitat type crossed by the transmission corridor. Uncommon habitat types crossed include Burn, Conifer Scrub and Wetland.

A more detailed description of vegetation is provided in Section 10.3.3.

4.1.1.2 Effects on Project Design, Construction, and Operations and Maintenance

Vegetation affected the Project design primarily during the selection of the transmission corridor and siting of Project components (i.e., converter stations, transition compounds). Corridor selection and component siting involved the compilation of information on existing vegetation to identify and evaluate key, sensitive vegetation communities. The specific transmission line routing and component siting that will occur during detailed Project design will avoid, to the extent practical, vegetation communities that are more sensitive to disturbance (e.g., wetlands, riparian shorelines, habitat types supporting listed plants), those that are more difficult to reclaim, and those that are of stakeholder or management concern (i.e., uncommon Habitat Types, limestone barrens).

Project Construction will be affected by vegetation during siting of construction infrastructure (e.g., temporary camps, marshalling yards, Horizontal Directional Drill (HDD) sites) and clearing activities (e.g., right-of-way (ROW) clearing). Nalcor will attempt to use existing disturbances (e.g., clear cuts) to the extent practical, and will also attempt to use parallel (or otherwise) existing disturbance corridors (e.g. roads, transmission line ROWs) to reduce the amount of new access that is required, and thus the amount of clearing. In addition, the amount and type of equipment required for the clearing process will be determined by the vegetation types within the areas that require clearing.

During Project operation, vegetation, such as trees, can cause power outages if they come into contact with the conductors. To prevent contact between vegetation and the conductor, the transmission line will be located within a cleared ROW 60 metres (m) wide, on average. It is also conceivable that tall trees outside the ROW that pose a risk to the transmission line operation may be selectively removed. During Project operation, vegetation within the ROW will be controlled through a combination of herbicide application and manual cutting, as described in Section 3.5.2.

4.1.2 Lightning

4.1.2.1 Environmental Conditions

Between two and three million cloud to ground lightning flashes were recorded annually in Canada between 1999 and 2008. Although lightning is recorded in Canada during every month of the year, it is most frequently recorded in July, followed by August and June (Environment Canada 2011a, internet site). Lightning activity recorded in major Newfoundland and Labrador cities and towns between 1999 and 2008 is described in Table 4.1.2-1.

Table 4.1.2-1 Lightning Activity in Major Newfoundland and Labrador Cities and Towns

City/Town	Area in Square Kilometres	Cloud to Ground Strikes (1999 to 2008)	Cloud to Ground Strikes per Square Kilometre per Year
Grand Falls-Windsor	11.62	18	0.15
Gander	6.22	7	0.11
Goose Bay	7.52	6	0.08
Mount Pearl	18.74	8	0.04
Corner Brook	14.23	6	0.04
Conception Bay South	21.26	6	0.03
Paradise	9.91	2	0.02
St. John’s	39.58	7	0.02
Labrador City	3.07	0	0.00

Source: Environment Canada (2011a, internet site).

The Canadian Electrical Association reports a 30-year average Annual Ground Flash Density of 0.7 flashes per square kilometre (km^2) per year (Canadian Electrical Association 1998) along the transmission corridor. Annual Ground Flash Density is the number of lightning strikes to ground during one year, averaged over the landmass area.

4.1.2.2 Effects on Project Design, Construction, and Operations and Maintenance

Lightning strikes can result in flashovers. The Project was therefore designed to include an Optical Overhead Groundwire (OPGW) that will be suspended from the tops of the transmission towers to protect the system from lightning strikes. In addition, counterpoise will be installed along the ROW to reduce the electrical resistance between the transmission tower and the ground. The counterpoise will be attached to the base of each tower to further protect the transmission line against damage from lightning. Within 1.6 km of the Soldiers Pond converter station, the transmission towers for existing Transmission Lines (TL) 217, TL 201, TL 218, and TL 242 will be rebuilt so that lightning protection (i.e., an OHGW) can be installed.

During Construction, lightning could strike a tower, which could affect Project personnel in the area.

Given the design measures described above, it is unlikely that lightning will affect Project operation. A lightning strike could result in a flashover; however, it is very unlikely that such an event would result in a power outage. Lightning strikes are also a major cause of forest fires, which could affect the Project. Forest fires are discussed in Section 4.1.3.

4.1.3 Forest Fire

4.1.3.1 Environmental Conditions

Forest fires occur with relatively low frequency in the province. Over the past decade, an average of 55 forest fires have occurred in Newfoundland each year, and an average of 45 forest fires have occurred in Labrador each year, as shown in Table 4.1.3-1. Although the incidence of fires is similar between Newfoundland and Labrador, the average size of fires in the two regions differs. The average extent of forest fires in Newfoundland is less than 3.5 hectares (ha) while the average extent of forest fires in Labrador is 470 ha (Sullivan 2010, pers. comm.). This difference is attributed to the DNR Forest Services Branch policy not to fight fires that do not threaten communities or harvestable resources (Michelin 2008, pers. comm.). As a result, most fires within Labrador do not generate a response, while most fires are actively suppressed in the more densely populated Newfoundland.

Table 4.1.3-1 Provincial Forest Fire Statistics for the Period 2000 to 2009

Year	Eastern Newfoundland		Western Newfoundland		Labrador	
	Number	Average Area (ha)	Number	Average Area (ha)	Number	Average Area (ha)
2000	108	0.49	16	11.17	95	1,564.00
2001	142	0.89	37	5.79	23	40.63
2002	74	1.67	18	10.27	51	21.18
2003	97	6.87	29	0.58	65	546.66
2004	104	11.5	19	1.68	30	37.65
2005	85	1.73	30	1.35	30	754.89
2006	36	1.69	27	3.55	33	99.37
2007	43	1.28	12	3.15	32	337.46
2008	50	1.39	22	1.46	67	75.23
2009	130	2.43	17	0.31	29	1,205.06
Average	**86.9**	**2.99**	**22.7**	**3.93**	**45.5**	**468.21**

Note: This table includes unpublished data provided by the Department of Natural Resources, Forest Services Branch, Forest Engineering and Industry Services Division, Fire Management and Co-ordination Section, Corner Brook (Sullivan 2010, pers. comm.).

In the experience of the provincial Forest Services Branch, fires that are fought rarely exceed 100 ha in size (Michelin 2008, pers. comm.). However, there have been forest fires fought over the past ten years that have exceeded 1,000 ha in Newfoundland and 30,000 ha in Labrador (Hewitt 2010, pers. comm.). Lightning caused

16.6 percent (%) of the 1,551 forest fires that occurred in the province between 2000 and 2009. Most of the other fires were caused by human activity (e.g., grass burning), and a small percentage of forest fires had unknown causes (Sullivan 2010, pers. comm.). Fires caused by lightning often occur in remote areas, resulting in fires that are larger and more difficult to control. Observations of local foresters and studies of lightning activity indicate that a single storm can provide an ignition source for numerous fires across a large area (Kasische and Stocks 2000; Kourtz 1967; Komarek 1966).

According to a study of the history of fire in the boreal forest of south-eastern Labrador (Foster 1983), forest fires occur from early June to late October, with peaks in ignition in late June and early July. Foster (1983) also found a good correlation between extensive fires and below average summer precipitation in south-eastern Labrador. Fires in the fall were generally short in duration and did not result in large areas of burn, as fires were extinguished by rain or early snowfall (Foster 1983).

Vegetation type also influences the probability and extent of a forest fire. Approximately two thirds of the Labrador portion of the transmission corridor crosses coniferous forest. On the Island, approximately half of the habitat crossed on the Northern Peninsula and through Central Newfoundland, and less than one third of the habitat crossed on the Avalon Peninsula is coniferous or mixed wood forest.

4.1.3.2 Effects on Project Design, Construction, and Operations and Maintenance

Although the potential for forest fires did not affect Project design, forest fires can result in damage to Project infrastructure, including the transmission line, wood poles of the electrode lines, and the converter stations during Project Construction, and Operations and Maintenance. The transmission line and associated infrastructure are located within a cleared ROW, where vegetation control measures will be implemented. The limited availability of fuel (i.e., vegetation) along the ROW is expected to limit the effects of a forest fire on transmission line infrastructure. In some cases, the ROW would act as a fire break and retard the spread of a fire. Although forest fires are not expected to affect the steel transmission towers, they could affect the converter stations or the wood poles connecting the transmission line to the electrode sites. The destruction of the wood poles would render the associated electrode unavailable until repairs could be completed. If a forest fire does encroach on the ROW, the transmission line may need to be temporarily taken off-line so that water bombers are not emptying their loads on energized lines.

Forest fire mitigation and response were factored into the effects analysis discussed in Chapter 12.

4.1.4 Wind, Freezing Precipitation and Ice Accretion

4.1.4.1 Environmental Conditions

Wind

The maximum hourly wind speed is commonly used, in combination with ice load, for transmission line design. Maximum hourly wind speed is defined as the maximum wind speed measured during the last two minutes before the hour. For the Project, data were obtained from 20 Environment Canada meteorological stations, located in the regions crossed by the transmission corridor. Five of these stations are located in Labrador, one in Québec (Blanc-Sablon), one on the Newfoundland side of the Strait of Belle Isle, and thirteen in Newfoundland. Seventeen of the 20 stations have collected more than 30 years of data.

Labrador

Labrador’s climate is more continental than maritime, so it experiences strong seasonal contrasts in the characteristics and movements of air masses. The predominant air flow is off the land (i.e., from the west). The Torngat Mountains in the north, with peaks above 1,500 m, and the Mealy Mountains in the south, with peaks approximately 1,200 m, confine the moderating influence of the Atlantic Ocean largely to the coastal regions. Compared with the maritime climate of the east coast of Labrador and the Québec north shore of the Gulf of

St. Lawrence, the continental climate of the interior is characterized by much colder winters and warmer summers (Environment Canada 1990).

In Labrador, the mean annual wind speed is 15 km/h. Along the coast (Cartwright) and the Québec north shore (Blanc-Sablon), the mean annual wind speed is between 20 km/h and 25 km/h, and the prevailing wind direction is from the south at Cartwright and from the west at Blanc-Sablon. In Upper Lake Melville, at Happy Valley-Goose Bay, the mean annual wind speed is 15.4 kilometres per hour (km/h) and the prevailing wind direction is from the south-west (Environment Canada 2010, internet site).

In central Labrador, the maximum hourly wind speed for a 50-year return period is between 60 km/h and 80 km/h. Along the east coast of Labrador and the Québec north shore, maximum wind speeds are higher, with 93 km/h recorded at Mary's Harbour, 100 km/h at Cartwright, and 120 km/h at Blanc-Sablon. The Belle Isle station is the windiest location, with a 50-year return period maximum hourly wind speed of 172 km/h, reflecting the funnelling effect of the Strait of Belle Isle. For all sites, January is the month with the highest wind speed (Environment Canada 2007, internet site).

Newfoundland

Newfoundland experiences a wide range of climates and weather, with many climatic features influenced by its unique geography. There are few topographical barriers to protect Newfoundland from weather systems, and Newfoundland's location on the eastern side of North America favours strong seasonal contrasts in the characteristics and movement of air masses. Newfoundland is the most maritime of the Atlantic Provinces, and this maritime climate generally results in more variable weather, with frequent low cloud, heavy precipitation, and strong winds (Environment Canada 1990).

Newfoundland is one of the stormiest parts of the continent, with some of the strongest winds of any province in Canada. Average annual wind speeds in Newfoundland are greater than 20 km/h (Environment Canada 1990). Generally, coastal areas have stronger winds than inland areas, valleys have lighter winds than elevated terrain, and winter is decidedly windier than summer. Winds are predominantly from the west year-round, but geographic and seasonal variations are common. The prevailing wind direction is west in winter and west-south-west in summer (Environment Canada 1990).

The mean wind speed from November to April is higher along the coast than inland, especially in the southern part of Newfoundland where it is 25 to 30 km/h. Bonavista, on the east coast, is the windiest location in Newfoundland, with mean wind speeds between 30 and 40 km/h. Inland (i.e., Deer Lake and Gander), the mean wind speeds are between 15 and 25 km/h (Environment Canada 2010). Calm or light wind occurs approximately 2% to 3% of the time along the coast but more than 10% of the time inland (Environment Canada 1990).

In Newfoundland, Badger and Deer Lake have maximum hourly wind speeds of 75 and 85 km/h, respectively, from November to April. For the other 11 stations, the maximum hourly wind speed is more than 100 km/h from November to April, except during some months in St. Anthony, Gander, Stephenville and Argentia, which are less exposed even though they are along the coast. Along the west coast of the Northern Peninsula, at Daniel's Harbour, the maximum hourly wind speed is 125 km/h and the bays along the coast can funnel the wind, further increasing this speed.

Freezing Precipitation and Ice Accretion

The two types of ice that can affect transmission lines and infrastructure are glaze ice and rime ice. Glaze ice is primarily caused by supercooled rain or drizzle striking a surface but not freezing rapidly on contact. Glaze ice is denser, harder, and sometimes more transparent than rime ice (Federal Aviation Administration 2010, internet site). Glaze ice typically creates a smooth, transparent and homogeneous ice coating. Rime ice typically forms at higher altitudes, on ridges and mountains. Rime ice forms in fog, when water droplets freeze to the outer surface of objects. Rime ice looks similar to frozen snow, is often not as dense as glaze ice and clings less tenaciously to surfaces. Rime ice occurs at low temperatures, and it can accumulate in large quantities.

In Labrador, extended periods of east or north-easterly winds bring moist air over the coast. This moist air is cooled by the pack ice and forced upward, resulting in freezing drizzle or light freezing rain along the coast (NavCanada 2011, internet site).

Freezing rain storms tend to be more frequent in Newfoundland than in Labrador. The area between St. John's and Gander is particularly prone to freezing precipitation. Freezing precipitation events in this region can last for several hours or occur intermittently over several days. Freezing rain or freezing drizzle occurs in Newfoundland, on average, for 175 hours each winter (NavCanada 2011, internet site).

Since the early 1970s, numerous studies have been undertaken to determine ice loading for the transmission line between Central Labrador and Newfoundland's Avalon Peninsula. These include studies by the Meteorological Research Institute of California during the early 1970s (Meteorological Research Institute of California 1973), RSW Incorporated studies in the 1990s (RSW-EDM 1999; RSW Incorporated 1999, 1995), and monitoring programs conducted by Newfoundland and Labrador Hydro between 1977 and 2002. The latter included the operation of Passive Ice Meters (PIM) at 22 sites and Rosemont Ice Detectors at three other locations between 1977 and 1987 which were located throughout the province. To measure glaze and rime icing events, anemometers and test tower sites were established at 25 locations throughout the province, and an ice monitoring program was conducted at Gull Island from the fall of 1999 to the summer of 2002. In 2009, Nalcor installed three test tower spans in the Long Range Mountains (LRM) which included data collectors. Analysis of the data is a direct input into the design of the HVdc transmission line through the LRM area.

4.1.4.2 Effects on Project Design, Construction, and Operations and Maintenance

In general, daily weather does not have a measurable effect on transmission lines; however, understanding extreme events is important for the prevention of transmission tower collapse or conductor failure. Transmission tower height and configuration and the selection of conductor for the Project considered the potential effects of extreme weather events. An Extreme Value Analysis provides transmission line loading for maximum ice, maximum wind and a combination of ice and wind loading. In some cases, extreme loading can be reduced through routing of the transmission line. For example, alternative corridor segments were considered over the Highlands of St. John and the Long Range Mountains due to high levels of icing in these areas. In other cases Project components are designed to withstand extreme loading conditions.

Through Extreme Value Analysis, the design load magnitude (i.e., the anticipated force on each component due to ice accumulation and wind) for acceptable Project reliability can be determined. The Extreme Value Analysis of transmission line loads considers weather properties such as precipitation amount, temperature, humidity and wind speed. Hourly information collected by weather stations across the province over many years, and the results of mathematical ice accretion modelling, are used to determine the loads that can be expected on the transmission line. Typically, low voltage transmission lines are designed for a 50-year return period (i.e., they are designed to withstand a load that is statistically expected to occur once every 50 years). As per International Electrotechnical Commission (IEC) standards (IEC 2003) and internal Nalcor design requirements, base meteorological loads have been developed to reflect a 50-year return period for the Project. This design standard has been selected to reflect a high and acceptable level of reliability related to safe transmission line Operations and Maintenance.

The meteorological loadings used during Project design consider historical climate records and Nalcor's operational experience with electricity transmission systems. For Project design, the following three loading zones were defined based on broad topographic and climatic features:

- normal region, where ice and wind loading are representative of the average loading for the province;
- alpine region, where the corridor is subjected to severe wind and ice loads; and

- eastern region, where higher levels of ice are known to occur.

In each region, design loads include freezing rain accumulation (i.e., glaze ice) and extreme winds. Design loads in alpine regions also include rime ice.

Despite the design considerations described above, wind, precipitation and ice accretion could affect Project Construction, and Operations and Maintenance. High winds and heavy precipitation could result in schedule delays during Construction and extreme ice accretion and high winds could result in tower collapse or conductor failure.

4.1.5 Salt Spray

4.1.5.1 Environmental Conditions

In maritime environments, wave action releases small droplets of water into the air. These droplets may be carried inland by the wind. Depending on the relative humidity, some or all of the water in these droplets evaporates, leaving smaller droplets of brine or dry salt particles. Typically, areas within 5 kilometres (km) of the ocean can experience some degree of salt spray and salt accumulation.

4.1.5.2 Effects on Project Design, Construction, and Operations and Maintenance

High voltage direct current technology is sensitive to salt spray from the maritime environment, so it is necessary to, wherever possible, locate the line inland and away from the coast. Salt deposition can form a conductive layer on the surface of the transmission line insulators, resulting in current leakage, also called flashover, which can result in the failure of the transmission system (i.e., a power outage). Transmission corridor selection and the design of the transmission towers considered salt deposition and the potential for flashover. For example, the transmission corridor on the Northern Peninsula was routed inland away from salt spray areas to the extent practical. On the Avalon Peninsula isthmus, between Sunnyside and Chapel Arm, the number of insulators on each transmission tower will be increased. To accommodate the additional insulators, the tower height and cross arm lengths were also increased. Washing the insulators, as may be required during Project operation, will also reduce the potential for flashover to occur. These designed-in mitigation measures will reduce the likelihood of salt spray affecting the reliability of the transmission line during Project operation. Salt spray is not expected to affect Project Construction.

4.1.6 Bathymetry

4.1.6.1 Environmental Conditions

The coast on the Labrador side of the Strait of Belle Isle is steep granite, rising to flat-topped ridges and summits from 300 m to 900 m above sea level. The coast on the Newfoundland side of the Strait of Belle Isle only rises to approximately 30 m above sea level. Water depths in the Strait of Belle Isle vary greatly, reaching over 125 m in places. Woodworth-Lynas et al. (1992) identified five physiographic zones in the Strait of Belle Isle defined by their bathymetry. The Labrador Coastal Zone consists of the north-western slope of the Labrador Trough, with depths up to 115 m, a width of 1 km to 2 km, and uniform slopes of 6% to 12%. The Centre Bank South and Centre Bank North zones have depths ranging from 15 m to 85 m and are separated by a narrow 85 m deep trough. The Newfoundland Trough is 5 km to 12 km wide with depths ranging from 70 m to 125 m. The Newfoundland Coastal Zone is bounded by the Newfoundland coastline and a linear escarpment that separates this Zone from the Newfoundland Trough.

Detailed bathymetric data were collected in Conception Bay, at the Dowden's Point location in October 2010. The maximum recorded depth was 5.5 m. The bathymetry shows the sea bed to be uniform with depth increasing with distance from the shoreline. No large depressions or hummocks on the sea bed were detected (Sikumiut 2011).

More information on the bathymetry of the cable crossing corridor and the electrode sites can be found in Section 10.6.1.

4.1.6.2 Effects on Project Design, Construction, and Operations and Maintenance

Bathymetry affected Project design primarily during the selection of the submarine cable crossing corridor and landfall, and during shoreline electrode site selection. The 500 m wide submarine cable crossing corridor was selected primarily because it would provide the greatest natural protection (e.g., protection from iceberg scour) for the cables, give the shortest distance to deep water and make use of natural sea bed features to shelter the cables in deep valleys and trenches. The selection of cable protection methods (i.e., HDD, rock berm) was influenced by water depths, terrain and sea bed geology, and substrate characteristics. Bathymetry is not expected to affect Project Construction, and the design measures described above are expected to reduce the potential for conductor failure during Project Operations and Maintenance.

Shoreline electrode sites were similarly influenced by bathymetry in the Strait of Belle Isle and Conception Bay, where natural sea bed and shoreline conditions affected electrode berm design (e.g., dimensions of electrode berm) and construction methods (e.g., potential excavation requirements for achieving 4 m water depth within the shoreline electrode pond). Bathymetry is not expected to adversely affect electrode operation.

4.1.7 Currents and Tides

4.1.7.1 Environmental Conditions

Tides in the Strait of Belle Isle and along the coast of Newfoundland are semi-diurnal with two highs and two lows during every lunar day (i.e., 24 to 25 hours). Water levels in the Strait of Belle Isle vary by approximately 2.2 m during large tides (DFO 2010, internet site). The timing of high and low tides in the Strait of Belle Isle is variable due to the influence of the Atlantic Ocean at the north end of the Strait and Gulf of St. Lawrence at the south end of the Strait.

There are two basic types of currents that flow through the Strait of Belle Isle and along the coast of Newfoundland. Surface currents are influenced by meteorological conditions (e.g., wind speed and wind direction) and tidal currents are generated by tides. Currents within the Strait of Belle Isle typically follow the orientation of the Strait. A branch of the Labrador Current flows south-west along the Labrador coast into the Gulf of St. Lawrence, while water flows north-east from the Gulf of St. Lawrence through the Strait of Belle Isle along the coast of Newfoundland (Canadian Ice Service 2001, internet site). Maximum surface flows of 2.6 metres per second (m/s) have been recorded near the Labrador coast in the Strait of Belle Isle, and 2.4 m/s near the surface in the middle of the Strait. Maximum tidal flows of 1.6 m/s were recorded both near the Labrador coast and in the middle of the Strait (BIO 2010, internet site).

To add to Nalcor's existing substantial knowledge of the currents in the Strait of Belle Isle cable crossing corridor, Nalcor is conducting a two year current monitoring program, commencing in 2011 and continuing into 2012.

In Conception Bay, tidal changes in water level are typically about 0.9 m, but can be up to 1.3 m for large tides (Canadian Hydrographic Service 2001). Surface flows in Conception Bay are typically less than 0.02 m/s (de Young and Sanderson 1995) but have been recorded at speeds up to 0.43 m/s (Seaconsult 1990). Tidal flows are typically between 0.01 m/s and 0.02 m/s (de Young and Sanderson 1995). Currents along the eastern side of Conception Bay and near the mouth of Conception Bay are stronger than average, typically between 0.1 m/s and 0.2 m/s (de Young and Sanderson 1995).

More detailed information on currents and tides can be found in Section 10.6.2.

4.1.7.2 Effects on Project Design, Construction, and Operations and Maintenance

Currents and tides were considered during the design of the submarine cable crossing and the shoreline electrode sites, and will be further considered during final Project design. Horizontal directional drilling will allow the submarine cables to be installed below the sea bed for the first 1.5 km to 2.5 km on each side of the Strait of Belle Isle. The submarine cables will therefore not be affected by low tides or nearshore currents. When constructed and laid on the seafloor, the submarine cables will be sheltered by rock berms from the currents and any debris carried by the currents. Given these design measures, currents and tides are not likely to affect submarine cable Construction or Operations and Maintenance.

Tides could affect electrode operation if the electrodes do not remain submerged during low tide conditions (i.e., saltwater would not be available to dissipate the electrical current). As a result, the depth of the shoreline electrode ponds were designed to account for the installation of the electrode elements in the shoreline pond and changes in the water level due to tides and / or currents. The depth of the pond will be such that the electrode elements are fully immersed in the water under various tide or current conditions. Tides are expected to affect the construction sequence for the shoreline electrode berm in that the rock core material will be placed up to the high tide water level, then the electrode berm top core will be placed by the excavator as it works back toward the shoreline, as described in Section 3.4.

Given the design measures described above, shoreline electrode operation is not likely to be affected by tides or currents.

4.1.8 Waves

4.1.8.1 Environmental Conditions

Wave activity in the Strait of Belle Isle is influenced by wind speed and direction and, as a result, wave direction and height typically differ between the Labrador and Newfoundland sides of the Strait of Belle Isle. On the Labrador side, wave height is usually less than 0.5 m with an extreme wave height of 7.0 m. Waves on the Labrador side generally travel from a south-westerly direction. On the Newfoundland side, wave height is usually less than 0.5 m with an extreme wave height of 5.5 m. Waves on the Newfoundland side generally travel from a westerly or south-westerly direction (AMEC 2010).

Wave activity on the east coast of Newfoundland is also influenced by wind speed and wind direction. Waves typically travel from the west in the fall and winter and from the south-west during the spring and summer months. Wave height varies throughout the year. The lowest wave heights typically occur in July with an average height of 1.6 m, and the highest waves typically occur in December, with an average height of 3.4 m (Environment Canada, Atlantic Climate Centre 2003).

More detailed information on waves can be found in Section 10.6.3.

4.1.8.2 Effects on Project Design, Construction, and Operations and Maintenance

The Project was designed such that HDD will permit the submarine cables to be installed below the sea bed for the first 1.5 km to 2.5 km on both sides of the Strait of Belle Isle. As a result, there is not likely to be any interaction between the submarine cable and the wave environment as the cable installation will be designed for the wave conditions in the Strait of Belle Isle. High wave conditions may, however, affect the submarine cable crossing construction schedule as construction vessels (e.g., cable installation vessel, fallpipe vessel) will operate on the water surface, within the wave environment.

The shoreline electrode site berms will be designed to withstand the expected worst case site conditions, including wave action. Wave height up to 7 m is expected along the Strait of Belle Isle and wave height up to 5.5 m is expected on the east coast of Newfoundland, thus requiring a significant electrode berm structure and armour for the shoreline electrodes. The electrode berm has therefore been designed as a rubble mound structure with larger sized rocks used as armour stone on the sea side slope to protect the electrode berm from storm waves. Waves may affect the electrode construction schedule and, under extreme wave conditions, may affect the structural integrity of the electrode berm.

4.1.9 Sea Ice and Icebergs

4.1.9.1 Environmental Conditions

Sea ice in the Strait of Belle Isle is a combination of land-fast ice formation and pack ice, which drifts in from the Labrador Sea. Historical records for the Strait of Belle Isle show a median ice thickness of approximately 0.45 m between 1971 and 2011, and a maximum ice thickness of less than 0.6 m (Environment Canada 2011b, internet site). Freeze-up typically begins in about December and the ice reaches its maximum thickness in about February. The Strait of Belle Isle waters are typically ice-free by May (Environment Canada 2011b, internet site).

Conception Bay contains primarily pack ice during the winter and spring seasons. The majority of ice in Conception Bay is new ice, with some grey ice near the bay mouth (Canadian Ice Service 2001, internet site). Historical records of ice coverage for East Newfoundland waters, including Conception Bay, show a median ice thickness of approximately 0.15 m between 1971 and 2011, and a maximum ice thickness of less than 0.3 m (Environment Canada 2011b, internet site). Freeze-up typically begins in January and the ice reaches its maximum thickness in March. The East Newfoundland waters are typically ice-free by May (Environment Canada 2011b, internet site).

Every year about 40,000 medium- to large-sized icebergs calve from Greenland glacier and are carried southward by the Labrador current. Only about 400 to 800 make it as far south as St. John's, but these numbers can vary greatly from year to year. The chances of observing icebergs in a particular area depend on the number of icebergs, wind direction, ocean currents and temperatures, and the amount of sea ice, or pack ice. Approximately 10% to 15% of the icebergs that pass the latitude of the Strait of Belle Isle move into the Strait. The remainder pass to the east of Newfoundland (C-CORE 2004).

More detailed information on sea ice and icebergs can be found in Section 10.6.4.

4.1.9.2 Effects on Project Design, Construction, and Operations and Maintenance

C-CORE (2004) conducted a study of iceberg scour risk in the Strait of Belle Isle as part of another project. The results of the study suggest that a shoal located north-east of the submarine crossing corridor and Centre Bank North prevents large, deep icebergs from entering the Strait of Belle Isle. C-CORE used iceberg frequency, drift speed, iceberg keel depth, water depth and sea bed slope to determine grounding rates in the Strait of Belle Isle. The C-CORE study predicts the highest grounding rates where sea bed slopes are relatively steep in the 30 to 60 m water depth range. The Project is designed such that HDD will permit the submarine cables to be installed below the sea bed for the first 1.5 to 2.5 km to 60 m to 80 m water depth on both sides of the Strait of Belle Isle, thus protecting the cables from both sea ice in the shallower water and iceberg scour. The exact length and depth of the HDD paths will be finalized during detailed Project engineering and will consider the risk of iceberg scour.

Sea ice could affect the structural integrity of the electrode elements and the voltage gradient during electrode operation (i.e., if the electrodes are located within the ice). The shoreline electrode berms will be designed to withstand the expected worst case pack ice conditions and freezing inside the shoreline pond. The depth of the shoreline pond required at the land side toe line will account for changes in the water level due to ice formation within the shoreline pond. The depth of water will be such that the electrode elements are fully immersed in the water below the ice under various tide conditions.

The ports to be used for the delivery of materials required for Construction have yet to be finalized. These ports will be selected based on the potential effect of sea ice and icebergs on shipping. Given this factor, Project Construction is not likely to be affected by sea ice or icebergs.

The electrodes are located in relatively shallow water and protected by an electrode berm. The size of icebergs that could collide with the electrode berm structure will be limited by the depth of water surrounding the electrode berm. The electrode berm will be designed to withstand the potential force of a collision with smaller icebergs (i.e., bergy bits and growlers) likely at that depth of water.

Construction of the submarine cable crossing and shoreline electrodes will be scheduled to avoid in-water works when sea ice or icebergs are present or likely. As such, sea ice and icebergs are not likely to affect Project Construction. Given the design measures described above, Project Operations and Maintenance are also not likely to be affected by sea ice or ice bergs.

4.1.10 Seismicity

4.1.10.1 Environmental Conditions

Newfoundland and Labrador lies in a region of relatively low seismic risk (Natural Resources Canada (NRCan) 2011a, internet site). NRCan's map of earthquakes that have occurred in or near Canada between 1627 and 2009 show approximately eight historical earthquakes occurring in or near southern Labrador, two occurring within the Strait of Belle Isle and approximately 12 in or near Newfoundland. Each of these earthquakes had a magnitude of less than 4.0 on the Richter scale (NRCan 2011b, internet site).

NRCan (2011c, internet site) defines a significant earthquake as one that meets one or more of the following criteria:

- the magnitude of the earthquake is 6.0 or greater;
- the earthquake had an impact on the built environment or on the natural environment (e.g., landslide, rock fall, liquefaction, tsunami);
- the earthquake was felt by a significant number of Canadians; or
- the earthquake occurrence is supported by paleoseismological evidence (i.e., geological evidence).

NRCan subjectively categorized each historical earthquake as being significant or not based on its magnitude and impact. As a result, 51 of the approximately 60,000 seismic events that have occurred in Canada are considered significant. None of these events occurred in Newfoundland, Labrador or the Strait of Belle Isle.

It is, however, worth noting that in 1929, an earthquake measuring 7.2 on the Richter scale originated approximately 250 km south of Newfoundland along the southern edge of the Grand Banks, and therefore was not included in the information presented above. The earthquake triggered a tsunami which struck the shores of the Burin Peninsula. Sea levels rose by 2 m to 7 m and, at the heads of several long and narrow bays, water levels rose by as much as 13 m. More than 40 coastal communities along the peninsula were affected (NRCan 2011d, internet site).

4.1.10.2 Effects on Project Design, Construction, and Operations and Maintenance

Because Newfoundland and Labrador lies in a region of relatively low seismic risk, the Project is not likely to be affected by seismic activity. All Project buildings, including the converter stations and transition compounds, will be built to the standards of the National Building Code of Canada (NBCC) (National Research Council of Canada 2010). The NBCC uses earthquake probabilities and the nature of the ground motion most likely to occur at a site to determine structural design criteria.

In the unlikely event that a tsunami occurs and affects the cable landing points or the shoreline electrode locations, infrastructure such as the electrodes and transition compounds may be flooded and / or damaged, depending on the wave heights generated.

4.1.11 Climate Change

4.1.11.1 Environmental Conditions

The following discussion includes the consideration of recent climate change, as outlined in section 4.4.4.1 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011).

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are "greenhouse gases" that help insulate the earth and maintain a temperature that can sustain life. Scientists have concluded that human activities have led to an increase in atmospheric greenhouse gases, which is impacting the global climate. Activities such as the burning of fossil fuels and deforestation have led to a 30% rise in CO_2 levels since the Industrial Revolution. This, in turn, is changing the composition of the Earth's atmosphere. The increasing concentration of atmospheric greenhouse gases is causing temperatures to rise and is affecting the global climate (Newfoundland and Labrador Department of Environment and Conservation (NLDEC) 2005, internet site). Potential effects of climate change on regional resources are of increasing importance for energy producers. This subject is addressed in detail in Chapter 10 of this Environmental Impact Statement (EIS).

Climate is defined as the statistical average of weather conditions over a substantial period of time. Climate change is an acknowledged change in climate documented over two or more periods, each period including a minimum of 30 years (Catto 2006). Over the next century, changes in temperature, precipitation patterns and extreme events are predicted for Newfoundland and Labrador (NRCan 2010, internet site). These changes in climate are expected to be more pronounced inland than at the coastal areas due to the moderating effects of the Labrador Sea.

Temperatures along the coast of Labrador are anticipated to be relatively stable, generally cooler in the spring (-0.5 degrees Celsius (°C)), and warmer in the summer, fall and winter (0°C to 2°C) over the next 80 to 100 years. For the same period, the changes at Happy Valley-Goose Bay are expected to be more noticeable, with much warmer temperatures in the summer, fall and winter (4.5°C to 7°C) by the end of the century, and less change in the spring (1°C) (Lines et al. 2005). This change in average temperature is expected to be gradual and to affect precipitation types and patterns. In Newfoundland, temperatures in St. John's are predicted to rise by 4.5°C in the spring and summer and by 6°C during the fall and winter. In Gander, temperatures are expected to increase by 6°C in the summer and by 2.5°C to 4°C during the remainder of the year (Lines et. al. 2005).

The warmer temperatures during fall and winter are predicted to result in later freeze-up, heavier snow, more rain occurring later into the fall, and possibly more freezing precipitation during the fall and winter. With little change in spring temperatures, differences in ice break-up patterns are expected to be slight over the next century (Lines et al. 2005).

Slight increases in annual precipitation are expected over the next few years, with a 6% to 9% increase in annual precipitation by the end of the 80 to 100 year period (Lines et al. 2005). These precipitation trends are of interest when considered in combination with the predicted increase in temperatures and the seasonality of the predicted changes. A small decrease (3%) in average precipitation amounts are expected over the winter period, and a small increase (6%) is expected during the fall. There is less agreement among the global circulation and regional downscaling models regarding changes in spring and summer precipitation, ranging from a slight decrease in spring (2%) to an increase of as much as 13% during the spring and summer (Lines et al. 2005). The increased precipitation predicted for western portions of Atlantic Canada may result from a greater frequency of downgrading hurricanes and tropical storms reaching the area in the summer and fall months (Lines et al. 2005).

Anticipated changes in sea levels in the Strait of Belle Isle and along the coast of Newfoundland are influenced by both the global rate of change in sea levels (i.e., approximately 3 mm per year) and the local effects of isostatic rebound of the Earth's crust that has been occurring since the last glacial period (Batterson and

Liverman 2010). Given the continued warming of the Earth's oceans and the melting of the polar ice caps, the global rise in sea levels is expected to continue, and it is expected that they will exceed the effects of isostatic rebound. Sea levels in the Conception Bay area are expected to rise approximately 40 cm by 2049 (over 1990 levels), and 100 centimetres (cm) by 2099. In the Strait of Belle Isle, sea levels are expected to rise approximately 30 cm by 2049 and 80 cm by 2099 (Batterson and Liverman 2010). This rise in sea levels may have little effect where the coastline is composed of steeply-sloping bedrock. However, in low-lying and low-sloping coastal areas, sea level changes may have a greater effect (e.g., increased rates of erosion, coastal landslides, loss of beaches).

4.1.11.2 Effects on Project Design, Construction, and Operations and Maintenance

The extent to which the climate will change over the next 100 years is uncertain. However, predictive modelling suggests the potential for changes in temperature, precipitation patterns, the frequency and severity of extreme events, and sea levels. These changes could lead to an increase in ice and wind loading on transmission line infrastructure, the availability of dry vegetation for forest fire propagation, a change in the frequency of lightning strikes, or flooding of onshore or electrode berm infrastructure at the shoreline electrode sites. The potential effects of the changing climate on the Project are mitigated through the selection of an appropriate meteorological return period and the application of safety factors to the design process. Design of the shoreline electrode sites will account for potential sea level changes throughout the life of the Project.

Nalcor will inspect 100% of the transmission line each year via ground patrol or helicopter. Approximately 10% will be completed through climbing inspections, on a yearly basis. During these inspections, the effects of climatic events (e.g., sign of physical damage, general condition of the equipment) will be noted and repairs or equipment replacement will be conducted as necessary. Nalcor will also monitor extreme weather events and have emergency response plans in place to address the effects of these events on the Project.

4.2 Socioeconomic Environment

4.2.1 Land and Resource Use

4.2.1.1 Environmental Conditions

The regions crossed by the transmission corridor have economies that are primarily based on natural resource industries and, in some cases, tourism. Land uses in the Project area include communities and transportation systems, natural resource-based industries (e.g., forestry, mining and agriculture), commercial activities (e.g., hunting, trapping and outfitting), recreational activities (e.g., boating, snowmobiling, cross-country and downhill skiing, kayaking, canoeing, hiking, bicycling, bird watching and riding motorized recreational vehicles) and subsistence activities (e.g., fishing, hunting and other harvesting). The Project area also includes recreation areas (e.g., cottage developments, campgrounds, ski areas, trails, lakes, golf courses and parks) and protected areas.

More information on land and resource use can be found in Section 15.4.

4.2.1.2 Effects on Project Design, Construction, and Operations and Maintenance

Land and resource use affected the Project design primarily during transmission corridor selection, siting of Project components and siting of construction infrastructure (e.g., temporary camps, marshalling yards). A constraints mapping exercise was conducted early in the planning process, during which information on existing land and resource use was compiled to identify and evaluate key socioeconomic factors for consideration in the transmission corridor selection and component siting process. Inputs to this analysis and planning process included existing and available information on the socioeconomic environment, any baseline information collected, issues identified as part of the environmental assessment process, and the results of the associated stakeholder consultations. Land and resource use factors that influenced the selection of the transmission corridor and siting of components include the avoidance of interactions with communities and protected areas, where possible and practical, and minimizing the creation of new access.

The mitigation measures described in various sections throughout the EIS (e.g., timing of activities, public access restriction) are expected to minimize the effects of land and resource use on the Project during Construction, and Operations and Maintenance. These effects could include interactions between land use activities (e.g., hunting, snowmobiling, riding recreational vehicles) and Project activities / equipment that could lead to schedule delays.

4.2.2 Fisheries

4.2.2.1 Environmental Conditions

The economies of the areas on both sides of the Strait of Belle Isle have traditionally been based on fishing. Fishing in the Strait of Belle Isle, near the submarine cable crossing, is primarily focused on lobster, scallops, pelagic species, and some newer or emerging fisheries. Fishing activity in the area is pursued by fishers from communities near the cable crossing corridor on both sides of the Strait, and by fishers from further away who travel to the area for specific fishing opportunities (e.g., herring). There are currently no licensed aquaculture sites in or near the cable crossing corridor. The closest existing aquaculture operations are more than 75 km away, at the north-eastern tip of the Northern Peninsula in the Pistolet Bay – St. Lunaire-Griquet area (Department of Fisheries and Aquaculture (DFA) 2010, internet site).

In the Dowden's Point area, nearshore fishing grounds are used mainly for the harvest of pelagic species such as capelin, herring and mackerel. Most pelagic fishing activity occurs south of the Holyrood Generating Station (Fisheries and Oceans Canada (DFO) 1990-2009). Lobster, herring and lumpfish are harvested closer to shore in the area between Lance Cove and Dowden's Point. Recreational fishing activities in the immediate vicinity of the proposed electrode site include the harvest of brown trout by trolling gear close to shore, and cod using handlines, usually in water depths between 32 and 36 m (Lear 2011, pers. comm.).

More information on fisheries can be found in Section 15.7.

4.2.2.2 Effects on Project Design, Construction, and Operations and Maintenance

Fisheries affected the design of the submarine cable crossing and the shoreline electrode sites. To minimize the potential for interactions between fishing activity and the submarine cable, HDD will permit the submarine cables to be installed below the sea bed for the first 1.5 km to 2.5 km on both sides of the Strait of Belle Isle. Where the cable lies on the sea floor, it will be covered by a 0.8 m to 1.5 m high and 8m to 12 m wide rock berm to protect from potential dragging of fishing equipment.

The shoreline electrodes will be protected from interaction with fishing activity by a berm to separate the electrodes from the open sea.

In addition to the design features described above, the mitigation measures described in various sections throughout the EIS (e.g., timing of activities, vessel watch protocols) will likely minimize the effects of fisheries on the Project during Construction Phase and, as applicable, during the Operations and Maintenance Phase. These effects could include interactions between fishing boats and Project vessels, which could have schedule implications. The Project includes three submarine cables, one of which is a spare, designed to be used in case of failure of one of the other cables.

4.3 Summary

The environment has played and will continue to play a key role in Project design. Although many effects of the environment have been mitigated through Project design, potential effects of the environment on the Project could result from vegetation; lightning; forest fire; wind, freezing precipitation and ice accretion; salt spray; currents and tides; waves; sea ice and icebergs; seismicity; climate change; land and resource use; and fisheries. Many of these potential effects have been primarily mitigated through the siting of the transmission corridor. Additional mitigation measures are summarized in Table 4.3-1. The effects of the environment on the Project are not likely to affect Project Construction or Operations and Maintenance in a manner that affects the Project's technical or economic feasibility. The effects of the environment on the Project are therefore not considered significant.

Table 4.3-1 Summary of the Potential Effects of the Environment on Project Design, Construction and Operations and Maintenance

Environmental Component	Potential Effect on Project Design, Construction and Operations and Maintenance	Mitigation
Vegetation	**Design** – vegetation affected the transmission corridor selection and siting of Project components. **Construction** – vegetation will affect siting of construction infrastructure and clearing activities. **Operations and Maintenance** – a power outage could result from contact of vegetation with the conductor.	– Selection of transmission corridor, siting of Project components, and siting of construction infrastructure will avoid, to the extent practical, vegetation communities that are sensitive to disturbance, difficult to reclaim or of stakeholder or management concern – Vegetation control during Operations and Maintenance, as and where required
Lightning	**Design** – lightning protection measures are included in Project design. **Construction** – erect tower, could affect project personnel in the immediate vicinity. **Operations and Maintenance** – flashover resulting in power outage.	– Installation of OPGW and counterpoise – Replacement of existing transmission lines TL217, TL201, TL218, TL242 so that OHGW can be installed
Forest Fire	**Design** – no effect anticipated. **Construction** – damage to construction and Project infrastructure. **Operations and Maintenance** – damage to Project infrastructure.	– ROW clearing – Vegetation control during Operations and Maintenance, as and where required
Wind, Freezing Precipitation and Ice Accretion	**Design** – affected transmission corridor selection and design loads. **Construction** – schedule delays. **Operations and Maintenance** – tower collapse, conductor failure, flashover.	– Transmission corridor selected to avoid regions of high wind and ice loads, where practical – Design load calculations based on local meteorological conditions and a 50-year return period

Table 4.3-1 Summary of the Potential Effects of the Environment on Project Design, Construction and Operations and Maintenance (continued)

Environmental Component	Potential Effect on Project Design, Construction and Operations and Maintenance	Mitigation
Salt Spray	**Design** – affected transmission corridor selection and design of insulators. **Construction** – no effect anticipated. **Operations and Maintenance** – flashover.	– Transmission corridor selected to avoid coastal regions, where practical – Number of insulators increased in areas of salt exposure – Transmission tower height and cross arm length increased to accommodate increased number of insulators – Washing insulators, as necessary, during Project Operations and Maintenance
Bathymetry	**Design** – affected submarine cable corridor selection, selection of landfall, selection of cable pull-in location, selection of electrode sites, and design of the electrode berms. **Construction** – no effect anticipated on submarine cable construction. May affect shoreline electrode construction methods (e.g., potential excavation requirement to achieve 4 m water depth). **Operations and Maintenance** – no effect anticipated.	– Submarine cable crossing corridor selected to achieve quick access to deep water, make use of natural sea bed features to shelter the cables in deep valleys and trenches – Selection of cable protection methods (i.e., HDD, rock berm) – Selection of shoreline electrode sites, electrode berm designs, and construction methods
Currents and Tides	**Design** – inclusion of HDD and rock berm, design of shoreline electrode ponds. **Construction** – no effect anticipated on submarine cable crossing. May affect construction sequence for shoreline electrode berms. Cable installation will be designed for installation in the currents present on-site. **Operations and Maintenance** – could affect the operation of the electrodes if the electrodes do not remain submerged during low tide events.	– Construction methods that can withstand the local current and tide conditions – Depth of the shoreline electrode pond will be such that the electrode elements are fully immersed in the water under various tide conditions – Protection of submarine cables by horizontal directional drilling under near-shore areas and protection by a rock berm where the cables lie on the sea bed
Waves	**Design** – inclusion of HDD, design of shoreline electrode berms. **Construction** – high wave activity may affect construction schedule. **Operations and Maintenance** – no effect on submarine cable anticipated. Damage to shoreline electrode berms.	– Use of larger sized rocks as armour stone on the sea side slope of the electrode berms

Table 4.3-1 Summary of the Potential Effects of the Environment on Project Design, Construction and Operations and Maintenance (continued)

Environmental Component	Potential Effect on Project Design, Construction and Operations and Maintenance	Mitigation
Sea Ice and Icebergs	**Design** – inclusion of HDD, design of shoreline electrode berms, depth of shoreline electrode ponds. **Construction** – schedules to avoid in-water works when sea ice or icebergs present. **Operations and Maintenance** – damage to the submarine cables or shoreline electrodes due to iceberg scour. Changes in resistivity of medium (i.e., water versus ice) surrounding the shoreline electrodes.	– Depth of the shoreline electrode ponds will be such that the electrode elements are fully immersed in the water and below the ice under various tide conditions – Electrodes will be located in relatively shallow water and protected by an electrode berm – An HDD will be used to install the submarine cables under the sea bed for the first 1.5 to 2.5 km on either side of the Strait of Belle Isle – A spare cable for the Strait of Belle Isle crossing
Seismicity	**Design** – design standards to consider seismic loading, as appropriate. **Construction** – no effects anticipated. **Operations and Maintenance** – structural damage due to earth movement. Flooding and / or structural damage to shoreline infrastructure from tsunami.	– Project buildings will be designed to National Building Code of Canada standards
Climate Change	**Design** – loads calculations and design of marine infrastructure to account for potential changes to weather patterns and sea level. **Construction** – no effect anticipated. **Operations and Maintenance** – effects associated with a potential increase in ice and wind loading (e.g., tower or conductor failure), availability of dry vegetation to fuel forest fires, change in frequency of lightning strikes, and flooding of electrode sites.	– Design load calculations based on a 50-year return period – Application of safety factors to the design process – Regular transmission line inspections and monitoring of extreme weather events – Design of shoreline electrode sites will account for potential changes in sea level
Land and Resource Use	**Design** – affected transmission corridor selection and siting of Project components. **Construction** – will affect construction scheduling, siting of construction infrastructure and clearing activities. Interaction between land use activities and Project Construction activities. **Operations and Maintenance** – interaction between land use activities and Project Operations and Maintenance activities.	– Selection of transmission corridor, siting of Project components, and siting of construction infrastructure will avoid, to the extent practical, communities and protected areas – Creation of new access will be limited to the extent practical

Table 4.3-1 Summary of the Potential Effects of the Environment on Project Design, Construction and Operations and Maintenance (continued)

Environmental Component	Potential Effect on Project Design, Construction and Operations and Maintenance	Mitigation
Fisheries	**Design** – use of HDD, rock berm and shoreline electrode berms. **Construction** – interaction between fishing activity and submarine cable installation activity and shoreline electrode pond construction. **Operations and Maintenance** – interaction between fishing lines, nets or rakes, and submarine cable.	– An HDD will be used to install the submarine cables under the sea bed for the first 1.5 to 2.5 km on either side of the Strait of Belle Isle – Where the submarine cables lay on the sea floor, they will be protected by a rock berm – Installation of a spare submarine cable – Installation of electrode berms at the shoreline electrode sites

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 5

Accidents and Malfunctions

April 2012

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LIST OF ACRONYMS

Acronym	**Description**
/day	per day
CARs	Canadian Aviation Regulations
CEAA	*Canadian Environmental Assessment Act*
CSA	Canadian Standards Association
DFO	Fisheries and Oceans Canada
DND	Department of National Defence
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPP	Environmental Protection Plan
ha	hectare
HDD	horizontal directional drilling
HSEQ	Health, Safety and Environment Quality
HVdc	High Voltage direct current
ISO	International Standards Organization
kg	kilogram
km	kilometre
m	metre
m^2	square metre
m^3	cubic metre
MVC	motor vehicle collision
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
NLDNR	Newfoundland and Labrador Department of Natural Resources
NLEPA	Newfoundland and Labrador *Environmental Protection Act*
NLESA	Newfoundland and Labrador *Endangered Species Act*
non-PCB	non-polychlorinated biphenyl
OHSP	Occupational Health and Safety Plan
PCB	polychlorinated biphenyl
Project	Labrador-Island Transmission Link
ROW	right-of-way
SARA	*Species at Risk Act*
SHERP	Safety, Health and Environmental Emergency Response Plan
SIMOPS	Simultaneous Operations
TC	Transport Canada
TSB	Transportation Safety Board of Canada
VEC	Valued Environmental Component

5 ACCIDENTS AND MALFUNCTIONS

The *Canadian Environmental Assessment Act* (*CEAA*) requires that the environmental effects of accidents or malfunctions that are likely to occur in connection with the Labrador-Island Transmission Link (Project) be considered during the environmental assessment (EA) process. The *Environmental Impact Statement Guidelines and Scoping Document* for the Project, issued by the Government of Newfoundland and Labrador and the Government of Canada in May 2011 (Government of Newfoundland and Labrador and Government of Canada 2011), also includes a requirement in Section 4.5.2 for a description of potential accidents and malfunctions that may occur, their potential consequences, worst case scenarios, and the potential effects of these scenarios.

An accident refers to an unplanned or unexpected event, related to Project activities, that interacts with the environment (i.e., biophysical and / or socioeconomic environment). A malfunction refers to the abnormal operation of a Project component with subsequent environmental consequences. In the following discussion, accidents and malfunctions (i.e., unplanned events) are jointly referred to as “incidents”. This section identifies and describes potential incidents related to Project Construction, Operations and Maintenance. It also describes the potential environmental consequences (i.e., magnitude, extent, duration) of these incidents. Only incidents with potential environmental consequences are discussed. Worker health and safety are adequately addressed by the Nalcor Energy (Nalcor) Occupational Health and Safety Plan (OHSP), and are not addressed in the Environmental Impact Statement (EIS).

5.1 Methodology

Over the past 50 years, Nalcor and its subsidiaries have constructed and maintained approximately 6,700 kilometres (km) of electrical transmission and distribution lines. Based on this experience, industry knowledge and government agency statistics, the types of incidents that may occur during Project Construction, Operations and Maintenance are well understood. The methodology used to assess the environmental risk of incidents is illustrated in Figure 5.1-1.

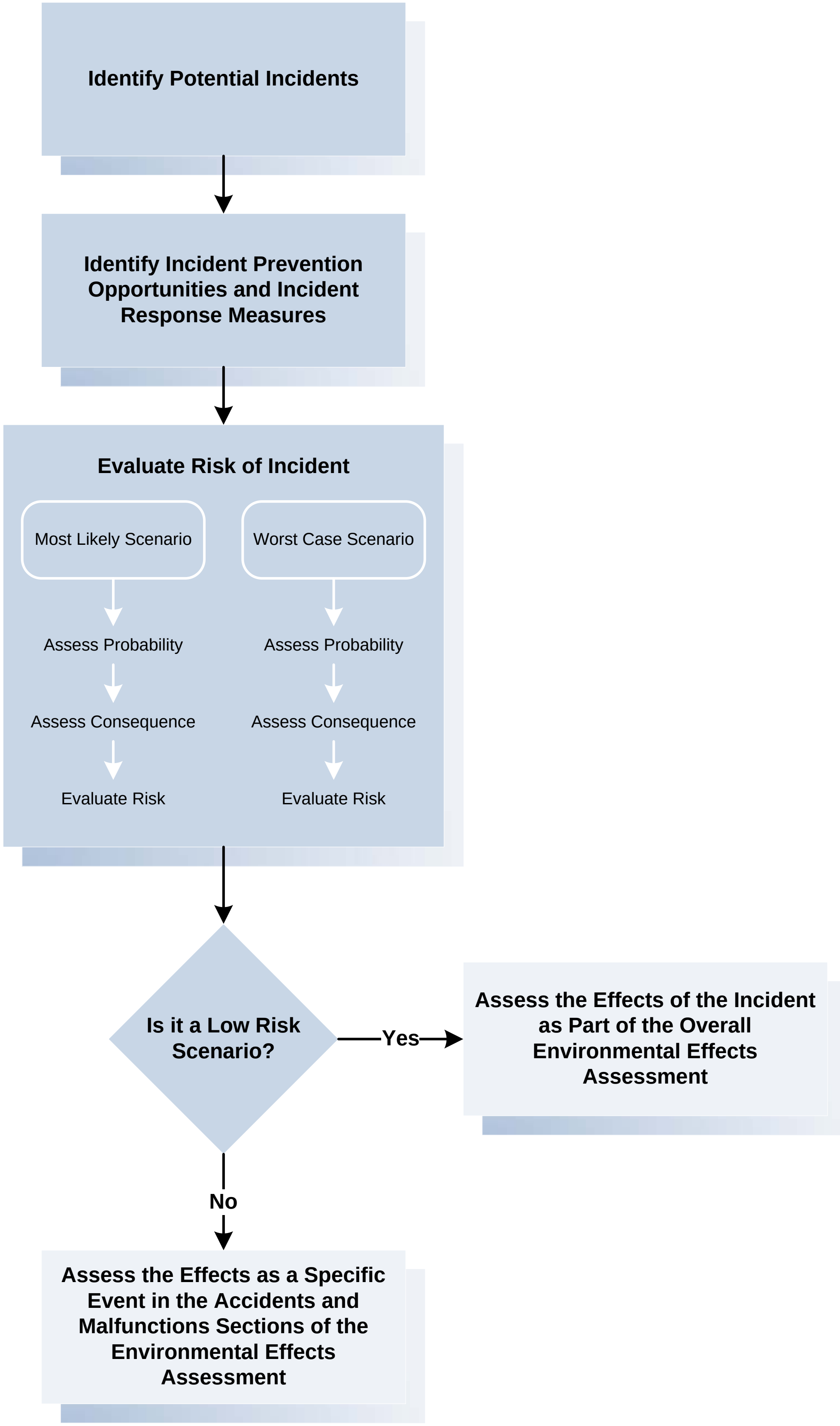
5.1.1 Identification of Potential Incidents

Potential incidents that could interact with the environment and that are likely to occur during Project Construction, or Operations and Maintenance are identified below. The following information was considered during the identification of potential incidents:

- historical incidents;
- Project inputs (e.g., fuel, materials);
- Project outputs (e.g., solid, liquid and hazardous waste);
- environmental threats (e.g., icing, heavy winds);
- hazards inherent to Project Construction (e.g., heavy equipment and marine vessel operation);
- hazards inherent to Project Operations and Maintenance (e.g., electrical hazards);
- management systems (e.g., procedures, training, inspections and monitoring); and
- protection safeguards (e.g., prevention measures, incident response plans and contingency plans).

Nalcor assessed accidents and malfunctions in the EIS, with this section used to screen the manner in which the particular scenario will be assessed. As part of the assessment, significance determination of the likely effects is made.

Figure 5.1-1 Approach to Assessing the Environmental Effects of Accidents and Malfunctions



5.1.2 Incident Prevention and Response

Standard prevention measures are identified for consideration during the assessment of accident and malfunction probability, and incident response measures are identified for consideration during the assessment of consequence. The following information is used during the identification of incident prevention opportunities and incident response measures:

- prevention and response measures described in the Safety, Health and Environmental Emergency Response Plan (SHERP) and the Environmental Protection Plan (EPP);
- conditions of regulatory permits and approvals;
- relevant legislative requirements; and
- capacity and capabilities of existing emergency response infrastructure.

5.1.3 Risk Evaluation

A most likely scenario and a reasonable worst case scenario are considered for each type of incident. A relative probability of occurrence is assigned to each scenario, based on Nalcor's experience, historical records of occurrence, and the judgement of the assessors. The most likely scenarios (e.g., a minor spill of hydrocarbons) typically have a moderate to high probability of occurring. Worst case scenarios (e.g., large forest fire) are possible, but typically have a much lower probability of occurrence. Definitions for low, moderate and high probability are provided in Table 5.1.3-1.

The environmental consequences of each scenario are then described. It is evaluated in terms of the surrounding biophysical environment, and considers the magnitude, geographic extent, duration and frequency of an incident. The most likely scenarios typically have a relatively low consequence (e.g., spill of hydrocarbons involving a small volume of material confined to an area of 1 square metre (m^2)). Worst case scenarios can have much higher consequence (e.g., fire that affects hundreds of hectares of forested land), but are less likely to occur. Definitions for low, moderate and high consequence are provided in Table 5.1.3-1.

The risk of each scenario is then evaluated with respect to probability of occurrence and environmental consequence. The incident risk evaluation matrix that is used to provide a first order characterization of an incident's risk profile is provided in Table 5.1.3-1. Low risk is considered unlikely to pose a serious threat to a Valued Environmental Components (VEC) and unlikely to represent a management challenge. Moderate risk is considered unlikely to pose a serious threat to a VEC but controls and recovery measures may be required. High risk is considered likely to pose a serious threat to a VEC and represents a management challenge.

Incidents that have a low to high probability of occurring and have a low consequence are considered to have a low risk. There are proven and effective prevention and mitigation measures for low risk incidents. These prevention and mitigation measures have been incorporated into Nalcor's standard construction and maintenance procedures, and they are included in the Project EPP. These low risk incidents are assessed as part of the overall environmental effects assessment for relevant VECs. Incidents that are considered to have a moderate to high risk are addressed as specific events in the Accidents and Malfunctions sections of the Environmental Effects Assessment chapters.

Table 5.1.3-1 Incident Risk Evaluation Matrix

Incident Risk Evaluation			**Consequence**		
			Low	**Moderate**	**High**
			Incident could result in a slight decline in the resource in the study area during the life of the Project. Research, monitoring, and / or recovery initiatives would not normally be required.	Incident could result in a decline in the resource to lower-than-baseline but stable levels in the study area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring and / or recovery initiatives may be required.	Incident could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and / or recovery initiatives should be considered.
Probability	Low	This type of incident has only rarely been reported for electricity transmission projects.	Low	Low	Moderate
	Moderate	Evidence supports the occurrence of this type of incident in some, but less than half, of electricity transmission projects.	Low	Moderate	High
	High	This type of incident is considered common for electricity transmission projects.	Low	High	High

5.2 Management Systems

Nalcor will proactively identify potential incidents related to Project Construction, and Operations and Maintenance. Prevention measures and response procedures will be described in the EPP, the SHERP, and the OHSP. These plans will be field-useable documents that address prevention measures and incident response procedures for unplanned safety, health and environmental events.

Nalcor has adopted the International Standards Organization (ISO) 14001 Environmental Management System (EMS) as their framework for environmental management and continual improvement (i.e., adaptive management). Programs developed under the EMS include emissions control, waste management and recycling, spills management, environmental remediation, and species and habitat diversity. Nalcor annually publishes an Environmental Performance Report, which provides information on accidents and malfunctions that have occurred on their projects and had environmental consequences.

Nalcor will implement Health and Safety, Environment, and Quality (HSEQ) Management Systems to meet the requirements of ISO14001:2004 (Environment), CAN Z1000-06 (Health and Safety), and ISO 9001:2000 (Quality). While each of these systems has its own focus and controls, Nalcor has adopted an integrated approach to common elements of the systems. Some of these common elements include:

- document and records control;

- communication;
- incident preparedness and response;
- compliance and management system auditing; and
- management review.

For these common elements, existing systems within the Nalcor HSEQ Management System will be used for the Project.

All Project Construction, and Operations and Maintenance personnel will be required to maintain a high level of vigilance, undergo regular safety training, and be familiar with the SHERP, the EPP and the OHSP. Third-party contractors will be screened for compatibility with Nalcor policies and procedures and only those that meet the criteria will be hired.

5.3 Identification of Potential Incidents

A list of potentially moderate or high risk incidents has been developed, based on Nalcor's experience in Construction, and Operations and Maintenance of electricity transmission infrastructure, government and industry statistics and the industry knowledge of the assessors. The information used to identify these incidents is described in Section 5.1.1. The EIS does not address all conceivable incidents. Rather, it addresses those that have occurred on similar projects and, based on Project design and the Project's environmental setting, may also occur during Project activities and may have environmental effects.

Potential incidents that may occur during Project Construction, and Operations and Maintenance include:

- transmission tower failure;
- electrocution;
- spills and leaks of hazardous material;
- frac-out during a Horizontal Directional Drill (HDD);
- slope failure;
- fires (except forest fires);
- forest fires;
- waste management incidents;
- motor vehicle collisions;
- marine vessel collisions; and
- aviation accidents.

For each of the potential incidents listed above, the following sections describe the potential incident, the measures that will be taken as part of the Project to prevent the incident from occurring, and response measures to be taken in the event that the incident does occur. This is followed by an assessment of the incident risk and a description of the potential worst case scenario.

5.4 Transmission Tower Failure

As part of the Project, several thousand steel transmission towers will be erected between the Muskrat Falls converter station and the Soldiers Pond converter station. These towers are designed to withstand extreme meteorological loads, however, a transmission tower failure is possible. During Project Construction, a transmission tower could fail as a result of soil conditions, meteorological conditions or work crew error.

During Project Operations and Maintenance, tower failure could result from meteorological conditions (e.g., ice storm), natural erosional processes (i.e., erosion of the supporting soils), or metal fatigue. Typically, if a tower does fail during Project Operations and Maintenance, adjacent towers may also be affected.

A transmission tower failure may have the following environmental interactions:

- collision with wildlife;
- ignition of a brush or forest fire;
- electrocution of fish and / or wildlife;
- disturbance of wildlife along the access trails, roads and right-of-way (ROW) during repairs; and
- risk to public safety.

5.4.1 Incident Prevention and Response

The transmission towers will be designed in accordance with Canadian Standards Association (CSA) (2009) standards.

During engineering design, both the tower type and meteorological forces (e.g., icing and wind conditions) are considered. To limit the extent of damage due to a transmission tower failure, anti-cascade towers will be installed at intervals along the transmission line. Anti-cascade towers are larger, stronger towers used at 15 to 20 tower intervals to contain the sequential failure of adjacent structures. The transmission towers are also designed to withstand loadings associated with a 50-year return period meteorological event (i.e., an event that is expected to occur every 50 years).

The transmission towers will be constructed in accordance with CSA standards and guidelines, and with the principle of Good Utility Practice. Good Utility Practice is defined as:

- The practice, methods and acts engaged in, or approved by, a significant portion of the electrical industry in North America, or any of the practices, methods and acts which, in the exercise of reasonable judgement in light of the facts known at the time the decision was made, are expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to one optimum practice, method or act to the exclusion of others, but rather to include all practices, methods or acts accepted in North America.

Following this principle, the construction of the transmission towers will be conducted by qualified, specialized contractors, with workers experienced in the erection of steel lattice tower transmission lines.

5.4.2 Risk Evaluation

Nalcor has experienced two transmission tower failures during conductor stringing, with both occurring during the Avalon Upgrade Project in the early 2000s. The first incident occurred when the conductor hooked into the guy wire of a guyed suspension tower, causing the guy to fail and the tower to fall. The second incident occurred when the conductor was over-tensioned, causing a light angle dead-end transmission tower to collapse. The tower was not capable of carrying the forces of the conductor, so this type of tower is no longer used by Nalcor. Based on Nalcor's experience constructing electrical transmission and distribution lines and considering the Project is designed for a 50-year return period meteorological event, the probability of a transmission tower collapse occurring during erection activities is low-moderate.

The effects of a collapse on the natural environment would be limited to the disturbance of terrestrial or aquatic habitat affected by the collapse, removal and reconstruction of the steel structure. The footprint of a transmission tower collapse would be approximately 100 square metres (m^2), with a small additional area disturbed by tower replacement or repair activities. As the affected area would primarily be contained within the cleared ROW, the consequence of this incident is low. The low-moderate probability of occurrence and the low consequence indicate a low risk of tower collapse during erection, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.3, and 16.3).

During Project Operations and Maintenance, there is a potential for a transmission tower failure to cause the collapse of adjacent towers. The transmission towers for the Project will meet Nalcor's current ice load standard and are designed for a 50-year return period meteorological event. The probability of transmission tower failure during Project Operations and Maintenance is low.

The effects to the natural environment would likely be limited to the disturbance of terrestrial and / or aquatic habitat associated with the collapse of up to 20 towers (over a linear distance of less than 10 km), and the effects resulting from the removal and replacement of the steel infrastructure. The collapse of adjacent towers may be limited by the tension in the conductor. Depending on the number of towers that fail, the consequence of tower collapse during conductor installation or Project Operations and Maintenance is low to moderate. The low probability of occurrence and low to moderate consequence indicate a low risk, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.3, and 16.3).

5.4.3 Worst Case Scenario

The worst case scenario is a tower failure during Project Operations and Maintenance that leads to the successive failure of 20 towers and the associated disturbance over a distance of less than 10 km. This scenario would most likely occur during or after an extreme weather event in the alpine or eastern design regions, where high ice loads are known to occur. Depending on the geographical extent of the storm, multiple groups of up to 20 towers may be affected by the same storm. The low probability of occurrence and moderate consequence indicate a low risk, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident that will be implemented by Nalcor and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.3, and 16.3).

5.5 Electrocution

During Project operation, an electrical current will travel through the Project converter stations, through on-land transmission lines, through the submarine cables and through the electrodes and wood pole electrode lines. Human or animal contact with a live wire or electrical equipment could lead to electrocution. Human or wildlife contact with high-voltage electricity can result in the following:

- human injury (e.g., burns, loss of limbs, damage to internal organs, and neurological damage) or death; and
- wildlife injury or death.

5.5.1 Incident Prevention and Response

Nalcor will proactively identify potential electrical hazards related to Project Construction, and Operations and Maintenance. Prevention measures and response procedures will be described in the EPP, the SHERP, and the OHSP. The following measures will be implemented to reduce likelihood of electrocution during Project Construction, and Operations and Maintenance:

- The transmission towers will be designed in accordance with CSA standards, as described in Section 5.8.1.
- "High voltage" signage will be posted on High Voltage direct current (HVdc) towers, the converter stations, transition compounds and electrode sites.

- "High voltage" signage will be posted where power lines are buried (e.g., between the transition compounds and their respective landing points) to ensure that there is no excavation or development in the cable areas.
- Public access to the converter stations will be restricted by galvanized steel security fences and locked gates.
- The electrode sites will be enclosed by locked, chain-link fences to prevent public access from the land and sea sides. Sea side fencing will be installed on the electrode berm crest.
- Avian-safe separation of the energized and / or grounded parts of the power line will be incorporated into the transmission line design.
- The submarine cable will be protected from interaction with fishing activity by HDD and the rock berm.

5.5.2 Risk Evaluation

The transmission system will be designed to trip out in the event of a ground fault. The system will attempt to clear the fault by reclosing and re-energizing the line. It will make a fixed number of attempts before remaining off-line. If a conductor failure occurs (i.e., if the conductor breaks), the line will trip out before coming into contact with anything. If a tower failure occurs and the conductor touches the tower, the system will trip out and the risk of electrocution is removed, unless a person or animal is in direct contact with the tower. If the conductor does not touch the tower at any point during the fall, the live conductor could come into contact with a person or animal on its way to the ground. Electrocution resulting from conductor or tower failure requires a specific combination of circumstances (e.g., tower failure during which the conductor does not touch the tower and a person or animal is located in the direct path of the falling conductor). For this reason, the probability of electrocution due to tower or conductor failure is low.

The probability of electrocution due to interactions between fishing equipment and the submarine cable is similarly low, as the cable is protected by HDD and a rock berm.

Electrocution of humans and most wildlife from regular operation of the transmission line is not likely due to the height of the conductors. However, birds travel and perch at transmission line heights. The probability of electrocution resulting in bird injury or death is influenced by the size of the bird, habitat crossed by the power line, prey availability, bird behaviour, age, season and weather. Twenty-nine of the 31 species of diurnal raptors and 19 species of owl that breed in North America have been reported as victims of electrocution; over 30 non-raptor species have also been reported in cases of electrocution (Avian Power Line Interaction Committee 2006). The probability of a bird experiencing electrocution is considered moderate, for electrode lines. The probability of a bird experiencing electrocution from the HVdc transmission line is not considered as the distance between the two conductors is too great for this to occur.

The consequence of electrocution to humans or wildlife depends on the magnitude of the current, the voltage and amperage, the duration of contact, and the electrical resistance of the body. In the case of electrocution of a human, serious injury or death may result, and the consequence is considered high. In the case of wildlife, transmission tower or conductor failure may result in the injury or death of a single animal. Electrocution from perching or colliding with transmission lines is similarly expected to result in a small number of bird injuries or deaths. Electrocution is not likely to have population level effects on wildlife, and the consequence on wildlife is low.

The low probability of occurrence of human electrocution and the high consequence indicate a moderate risk, as shown in Table 5.1.3-1. The moderate probability of occurrence of electrocution of wildlife (i.e., birds) and the low consequence indicate a low risk of wildlife electrocution. The human scenario will be addressed as a specific event in Section 16.10.2 of this EIS. For the wildlife scenario, there are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.3, 13.3, and 14.3).

5.5.3 Worst Case Scenario

The worst case scenario for humans is the electrocution of a person resulting in their death. The probability of this occurring is low and the consequence is high, as discussed in Section 5.13.2, indicating a moderate risk of human electrocution, as shown in Table 5.1.3-1. This scenario is addressed as a specific event in Section 16.10.2 of this EIS.

The worst case scenario for wildlife is the electrocution of an animal listed under the *Species at Risk Act* (*SARA*) or the *Newfoundland and Labrador Endangered Species Act* (Newfoundland and Labrador *Endangered Species Act* (*NLESA*)). The probability of this worst case scenario occurring is much less than the probability of a collision with a non *SARA*- or *NLESA*-listed animal due to the relative abundance of listed and non listed animals. The probability of occurrence depends on the species involved, their abundance, and their behaviour (e.g., perching preferences). Overall, this scenario is a low probability of occurrence. The consequence of this incident may be low to moderate, again depending on the species and its status. The low probability of occurrence and the low to moderate consequence indicate a low risk of electrocution of a *SARA*- or *NLESA*-listed animal, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.3, 13.3, and 14.3).

5.6 Spills and Leaks of Hazardous Material

During Project Construction, and Operations and Maintenance, environmentally hazardous materials such as hydrocarbons (e.g., gasoline and diesel), lubricating oils and hydraulic fluid will be used. Within the converter station, transformers will contain non-polychlorinated biphenyl (non-PCB) transformer oils. As part of its standard operating procedures, Nalcor strives to reduce the potential for leaks and spills through the implementation of its HSEQ management systems. Spills or leaks of hydrocarbons could occur along the ROW, at the converter stations, along access roads and in the Strait of Belle Isle as a result of incidents involving heavy equipment, vehicles and marine vessels that contain fuel, oil and lubricants (e.g., excavators, mechanical harvesters, cranes, drill rig, fallpipe vessel and cable installation vessel). During Project Operations and Maintenance, there is a potential for spills or leaks of herbicide used for vegetation management along the ROW. Leaks or spills of fuel, battery acid, and transformer oils could also occur during converter station Construction, and Operations and Maintenance.

Spills or leaks of hazardous material may have the following environmental interactions:

- surface water contamination interactions with fish and aquatic habitats;
- groundwater contamination interactions with human health if the material reaches an aquifer used for human consumption;
- wildlife mortality, wildlife habitat alteration, loss or fragmentation;
- loss or alteration of vegetation; and
- soil contamination.

5.6.1 Incident Prevention and Response

The Project EPP will contain conditions for fuel handling and storage, including procedures for spill response.

The SHERP will include specific instructions for the prevention of and response to spills or leaks of hazardous material. Spill response kits will be maintained at all work sites, and spill kit contents will be based on the volume of fluids in use, the type of fluid, proximity to water and other relevant factors. All personnel involved in hydrocarbon transport and transfer will be trained in spill response. A Response Team will be formed, trained and will receive regular practice in “mock” responses for incidents that require co-ordinated action. Any spills in excess of the amount, concentration, level, or rate of release authorized by the Newfoundland and

Labrador *Environmental Protection Act* (*NLEPA*) or any Project approvals granted under the *NLEPA* will be reported to the Newfoundland and Labrador Department of Environment and Conservation (NLDEC).

Handling and fuelling procedures will comply with the *Storage and Handling of Gasoline and Associated Products Regulations* (CNR 775/96) and any additional requirements set forth by the NLDEC. During construction, hydrocarbon supplies will be transported by tanker trucks and in drums or other approved containers. Fuelling stations will be established along the ROW, with self-dyked steel storage tanks and the largest fuel storage tank on-site will hold no more than 125,000 litres (L). The fuelling stations at marshalling yards and camps will include concrete pads and controls to retain drainage in a sump where any hydrocarbons can be captured and separated prior to release of the runoff. For equipment with reduced mobility, such as heavy lift cranes and excavators, fuel will be delivered by a double walled approved mobile tank and re-fuelling will take place on-site. All fuel transfers will follow safety procedures to prevent even minor leaks and drips.

All mobile storage tanks will be registered under, and comply with, the *Storage and Handling of Gasoline and Associated Products Regulations, 2003*, under the *NLEPA.* Records of all storage tank contents will be maintained to reconcile inventories as a check against undetected leakage. All transport vehicles will be licensed and maintained according to safety requirements. Fuelling or servicing of mobile equipment on-land will not be permitted within 50 m of a waterbody. Additionally, the use of biodegradable lubricants and hydraulic fluids where practical will be implemented with working in waterbodies.

Waste oil will be collected and stored in drums (clearly marked “waste oil”) inside a dyked area and will be regularly shipped for disposal. Waste oils, lubricants and other used oil will be disposed of at approved disposal sites.

Prior to fording a stream, equipment will be inspected to confirm that it is mechanically sound, to limit the potential for leaks of oil, fuel, and hydraulic fluids. Crossings will be at right angles and completed as expeditiously as safety allows.

Spills or leaks of hazardous material in water must be reported to Canadian Coast Guard who then refers the incident to the proper authority (Fisheries and Oceans Canada (DFO), Environment Canada, the province). All spills, regardless of volume, are to be reported. Spills or leaks of hazardous material on land must be reported to Government Services Centre who co-ordinate the provincial response.

5.6.2 Risk Evaluation

It is Nalcor’s experience that, even with best efforts to reduce the potential for leaks and spills, isolated, small (i.e., less than 2 L) spills and leaks could occur during Construction, and Operations and Maintenance activities. These incidents are most often the result of equipment failure (e.g., a break in a hydraulic hose), unanticipated hazards (e.g., vehicle collision) and human error (e.g., failure to follow procedures).

While not necessarily reflective of the type of activities to be carried out as part of the Project, Nalcor had 10 reportable spill or leak incidents within its operations in Newfoundland and Labrador in 2009, up from five in 2008. All of these spills involved petroleum products or petroleum derivatives, including heavy fuel oil, insulating oil, glycol and lubricating oil. The approximate volume for all reportable spills in 2009 was 64,331 L, up from 702 L in 2008. Approximately 64,000 L of the volume spilled in 2009 occurred in a single event at the Holyrood Thermal Generating Station. The release of heavy fuel oil was caused by two loose filters where the oil flows into the generating unit. The source of the release was promptly found and isolated, and clean up was initiated. The spilled oil was contained within the Holyrood plant and did not contaminate any water source (Nalcor 2010, internet site).

Project Construction is scheduled to take approximately four years, with work proceeding year-round on multiple construction work fronts. Small spills during construction typically involve less than 2 L of fluid, often result from hydraulic hose malfunctions, and are cleaned up immediately, as per the SHERP. Based on Nalcor’s experience and given the scale of construction activity for the Project, the probability of a small spill occurring during Project Construction is high. However, the consequence of a small spill is low.

Leaks and small spills could also occur during Project Operations and Maintenance. The entire transmission line will be inspected on an annual basis via ground patrol and / or helicopter, with a portion (10%) of the line being inspected by climbing inspections. Vegetation management will commence eight years following Construction and will be repeated every seven years thereafter. There will therefore be infrequent and brief activity along the transmission line ROW during Project Operations and Maintenance. The converter station will have transformer oils and may have diesel fuel present. These sites will include dykes to prevent release into the environment. Due to the low level of activity during Project Operations and Maintenance, the probability of a small spill is low and the consequence is expected to be low.

The low probability of occurrence and low consequence indicate a low risk of a small leak during Project Construction, Operations and Maintenance, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, and 14.4).

5.6.3 Worst Case Scenario

Two worst case scenarios are considered for spills and leaks of hazardous material. The first is a large spill of diesel fuel from a portable fuel storage system into the environment. Diesel fuel for the re-fuelling of heavy equipment will be transported in a 1,000 L portable fuel storage tank. The large spill scenario involves the breach of this fuel tank due to a mishap (e.g., roll over). Given that approved, double walled fuel storage tanks will be used to transport fuel and the implementation of the other environmental protection measures described in the SHERP and EPP, there is a low probability of a breach of a mobile fuel storage tank resulting in a large scale release of its contents. The consequence of such a spill, however, would be moderate to high, and the subsequent risk to the environment would be moderate.

The first reasonable worst case scenario carried forward in the EIS, therefore, is an accident involving a vehicle transporting 1,000 L of diesel fuel. The accident would cause a puncture or rupture in the fuel tank, resulting in the release of all 1,000 L of diesel fuel. Diesel would spill onto and over the ground and into a stream adjacent to the road. The response procedures described in the SHERP would be implemented by the work crew immediately. This scenario will be addressed as a specific event in Sections 12.6.3, 13.4.3, 14.5.3 and 16.9.2 of the EIS.

The second worst case scenario would be a large spill of fuel into the Marine Environment due to a collision between the fallpipe or cable installation vessel or a material transport ship and another boat or the seabed. The worst case scenario would involve a fully-fuelled vessel releasing all of its fuel into the sea. Given the environmental protection measures described in the SHERP, through the Simultaneous Operations (SIMOPS) system and the EPP and the compliance of Project vessels with the *Canada Shipping Act*, the probability of a large spill of fuel into the Marine Environment is low. The risk of marine accidents is discussed further in Section 5.13. Given the large quantity of fuel on board a fallpipe and material transport ship, the potential consequence of a large spill is high and the subsequent risk to the environment would be moderate to high. This scenario will be addressed as a specific event in Sections 14.5.3 and 16.9.2 of the EIS.

5.7 Frac-out During Horizontal Directional Drill

Three separate boreholes will be drilled on each side of the Strait of Belle Isle (i.e., Forteau Point and Shoal Cove) for the submarine cables. A pilot borehole will be drilled at each site, then one or two additional reaming passes will be completed to achieve the desired borehole diameter. This process will use a drilling mud composed of water and bentonite. During the HDD process, there is a potential for the release of drilling mud into the surrounding environment (i.e., frac-out). Frac-out of drilling mud (also referred to as inadvertent returns to surface) may occur if the downhole mud pressure exceeds the resistance of the soil or rock formation and also can occur through an existing fault / crack in the rock formation. The potential for frac-out is affected by the types of soil or rock that are encountered along the drill path, the depth of ground cover above the borehole, drilling mud properties and how the drill rig and mud pumps are operated.

Bentonite is non-toxic, however frac-out during HDD may have the following environmental interactions:

- terrestrial frac-outs are typically easy to contain, but may result in localized alteration or loss of listed plants; and
- the fine bentonite particles from a marine frac-out may interact with fish eggs, benthic invertebrates and marine plants.

5.7.1 Incident Prevention and Response

A geotechnical assessment has been conducted to assess the suitability of the Forteau Point and Shoal Cove sites for HDD. The drill path (i.e., location, depth) will be designed to minimize the potential for frac-out. A frac-out response plan will be developed and will include a description of HDD monitoring protocols, and procedures for containing and cleaning up a frac-out.

Measures have been or will be incorporated into the HDD process, including:

- the selection of drill sites considered the location of sensitive plants and habitat;
- material and equipment required to contain and clean up drilling mud will be readily accessible at the drill sites;
- the frac-out response plan will describe procedures for stopping work, containing the drilling mud, and notifying appropriate authorities (e.g., DFO);
- the frac-out response plan will assign clean up priority according to risk of potential harm and disposal of drilling mud such that it will not re-enter the Marine Environment;
- clean up procedures will not cause greater damage to the shoreline or Marine Environment than leaving the drilling mud in place;
- a marine frac-out will be monitored to determine whether the drilling mud congeals (bentonite will often harden, thus sealing the frac-out);
- if the drilling mud does not congeal, the drilling mud may be contained using an underwater boom and curtain;
- for a terrestrial frac-out, the drilling mud will be contained with hay bales, sand bags or silt fencing, then pumped into the return pit; and
- for a terrestrial frac-out that affects a vegetated area, reclamation will include site-specific measures to promote natural revegetation of the disturbed area.

5.7.2 Risk Evaluation

Some of the factors that contribute to the probability and consequence of frac-out include:

- local geology not suitable for HDD;
- drill path too shallow; and
- localized scouring of the seabed reducing depth of cover over the HDD path.

Much of the risk of frac-out can be reduced through a pre-drilling geotechnical assessment, and proper HDD planning and execution. A geotechnical assessment conducted for Forteau Point and Shoal Cove indicates that the local geology presents a low risk for frac-out. The depth of the drill path will be designed to minimize the potential for frac-out and will consider the potential effects of seabed scouring (e.g., from icebergs, fishing activity).

Given the results of the geotechnical assessment and the design measures implemented, the probability of a frac-out is low. The extent of a potential frac-out will be limited by careful monitoring of the HDD process, the development of a detailed response plan, and the availability of material and equipment for containing a drilling mud release at each drill site. The effects of a frac-out are expected to be localized, and the consequence is considered to be low.

The low probability of occurrence and a low consequence indicate a low risk of frac-out, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 14.2, and 14.3).

5.7.3 Worst Case Scenario

Two worst case scenarios have been identified. The first is a frac-out within the Marine Environment during which the drilling mud does not congeal and seal off the frac-out location. This scenario could result in the release of bentonite particles into the Marine Environment. The deposition of fine bentonite particles on the seabed may smother fish eggs, benthic invertebrates and marine plants depending on the location and the time of year. The second is a frac-out within the Terrestrial Environment that releases drilling mud in a location where *SARA*- or *NLESA*- listed plants are present.

The probability of these scenarios is low given the geotechnical assessment and design of the drill paths. The effects are expected to be localized, and the consequence is low-moderate. There are proven and effective prevention and mitigation measures for these types of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 14.2 and 14.3).

5.8 Slope Failure

Topographic conditions along the access roads and ROW are varied and include regions of high relief (e.g., the Long Range Mountains). Terrain along the access roads and ROW may be susceptible to slope movement, particularly where drainage associated with Project access roads results in the undercutting of slopes by streams and rivers during high precipitation events. There is also a potential for erosion of shoreline fill at the electrode sites to result in slope failure, or seabed slope failure to occur during construction of the shoreline electrode ponds.

Slope failure may have the following environmental interactions:

- alteration or loss of wildlife habitat;
- wildlife disturbance or mortality;
- alteration or loss of vegetation cover and timber resources;
- change in surface water runoff patterns, which could affect surface water quality and fish habitat;
- alteration of marine or freshwater habitat due to siltation;
- loss of infrastructure and / or land use; and
- risk to public safety.

5.8.1 Incident Prevention and Response

Where possible, Project components will be sited away from unstable terrain. Further preventive measures will be incorporated into Project design and will include slope stabilization measures, as appropriate.

The EPP will describe slope stabilization and erosion control procedures to be followed during Project Construction. All construction personnel will receive EPP training, and Nalcor and its contractors will comply with the commitments described in the EPP. The following slope failure prevention measures will be incorporated into Project design or described in EPP, as appropriate:

- geotechnical evaluations of specific locations will be undertaken by qualified engineers, as appropriate;
- in locations where slope instabilities are shallow, the depth of foundation or guy anchors may be increased, and drainage and erosion control measures may be implemented;
- construction of access roads will include drainage structures, where appropriate, and they will be inspected regularly to check that they are functioning properly;
- additional seasonal and end-of-construction drainage measures may be implemented, as necessary; and
- the potential for slope failures resulting from the erosion of shoreline fill at the electrode sites will be mitigated by slope flattening and revetment with riprap stone.

5.8.2 Risk Evaluation

Some factors that contribute to the probability and consequence of a slope failure include:

- additional loading at the top of a slope (e.g., placement of fill or rock at the top of a slope, erection of buildings or towers at the top of a slope);
- removal of lateral support along the surface of the slope (e.g., erosion by water or wind, excavation at the base of the slope);
- increased pressure within the slope (e.g., saturation with water, rapid water extraction); and
- earthquakes (i.e., physical disturbance of slope).

Most of these factors can be controlled through Project design (i.e., transmission tower siting, road design) and construction practices, as described in the EPP. The Project is in an area of low seismic risk (Geological Survey of Canada 2005). Although the resulting probability of slope failure is minimized through Project design and the preventive measures described in the EPP, and risk is also mitigated through site investigations to confirm soil properties prior to construction. Slope failures can occur through a combination of construction activity and natural processes. The probability of slope failure during Project Construction is characterized as low. During Operations and Maintenance, the probability of slope failure is also low, and could result from natural erosional processes affecting the soils supporting Project components.

The consequence of a slope failure is typically limited to the slope itself and an area at the base of the slope. The consequence depends on the extent of the slope failure, which may be affected by the size and steepness of the slope, vegetative cover, geotechnical conditions and the cause of the failure. In general, the effects are expected to be localized, and the consequence is low.

The low probability of occurrence and a low consequence indicate a low risk associated with slope failure, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, 14.4, and 14.5).

5.8.3 Worst Case Scenario

The worst case scenario is a slope failure that affects a riverbank or the marine shoreline (i.e., Strait of Belle Isle or Conception Bay). This scenario could occur where Project Construction is carried out adjacent to a watercourse or the coastline and it could result in a quantity of soil and rock entering the water and affecting fish and fish habitat locally and downstream of the incident. The probability of this scenario is considered low given the construction methods (e.g., HDD) and preventative measures that will be implemented, and the consequence would be low to moderate, depending on the characteristics of the receiving waterbody. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, 14.4, and 14.5).

5.9 Fires (Except Forest Fires)

The storage of combustible material or waste at the marshalling yards or campsites, and the operation of kitchen appliances within the campsites could result in a fire during Project Construction. The storage of combustible material or waste, or equipment malfunction at a converter station could result in fire during the Project Operations and Maintenance. Flammable liquids within the converter station will be limited to non-polychlorinated biphenyl PCB transformer oils.

A fire may have the following environmental interactions:

- reduction of the air quality due to the release of particulate matter and other contaminants into the atmosphere;
- alteration or loss of wildlife habitat;
- alteration or loss of vegetation;
- loss of infrastructure and / or land use; and
- risk to public safety.

5.9.1 Incident Prevention and Response

The SHERP will include a plan for preventing and combating fires. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. The fire prevention plan will be followed by Nalcor and its contractors. The SHERP will address the following fire prevention measures and incident response procedures:

- storage of flammable waste in fire resistant containers;
- appropriate and timely disposal of all flammable waste;
- the use of designated smoking areas;
- the burning of brush or debris will not be permitted; and
- in the event of a fire, immediate steps will be taken to contain or extinguish the fire to the extent practical and safe.

Fire-fighting equipment suitable to the labour force and working conditions will be available at each worksite during construction and at the converter stations and transition compounds during Project operation. This equipment will be maintained in proper working condition. A fire alarm and a fire suppression system will be installed at each converter station and transformers will be equipped with a water deluge system. Fire-fighting equipment will comply with the standards of, and have approvals of, Underwriters Laboratories of Canada Limited and will be maintained in accordance with National Fire Protection Association Codes. Nalcor will ensure that all Project field personnel are trained in the use of fire-fighting equipment and that trained personnel are available to respond immediately to an incident. Detailed information on fire-fighting equipment and procedures will be provided in the SHERP, the EPP and other environmental documents, such as terms and conditions of permits and authorizations.

5.9.2 Risk Evaluation

The implementation of the fire prevention procedures described in the SHERP will minimize the probability of a fire occurring during Project Construction, and Operations and Maintenance. As a result, the probability of a fire occurring on the Project is low.

The fire suppression systems and incident response plans will minimize the extent and duration of a fire, if one does occur. Although emissions from a fire could extend beyond the campsite or converter station, quick suppression of any fires is expected to limit both the terrestrial and atmospheric effects of a fire such that monitoring or recovery initiatives would not be required. The consequence of a fire is therefore expected to be low.

The low probability of occurrence and low consequence indicate a low risk of fire, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 11.2, 12.2, 12.3, 12.4, and 12.5).

5.9.3 Worst Case Scenario

The worst case scenario is a fire that cannot be contained by the site response crew. This scenario is more likely to occur where large amounts of flammable material are present (e.g., fuel storage), and during high wind conditions. In a worst case scenario, the fire would spread outside of the campsite or converter station, igniting a forest fire. Forest fire risk is addressed separately in Section 5.10.

5.10 Forest Fires

The operation of combustion engines (e.g., vehicles, heavy equipment, chain saws), blasting activity and general presence of workers have the potential to ignite forest fires. Both combustion engines and workers are expected to be present during most Project Construction, and Operations and Maintenance activities, and blasting may occur during foundation construction. Several Project activities will occur in forested areas where the ignition source could lead to a forest fire, depending on the season (i.e., the potential for forest fires would be minimal in the winter).

A forest fire may have the following environmental interactions:

- reduction of the air quality due to the release of particulate matter and other contaminants into the atmosphere;
- alteration or loss of wildlife habitat or wildlife mortality;
- alteration or loss of vegetation cover and timber resources;
- change in surface water run-off patterns, which could affect surface water quality and fish habitat;
- loss of infrastructure and / or land use;
- risk to public safety;
- change in the visual aesthetics of the landscape; and
- disruption to the recreational use of the area.

5.10.1 Incident Prevention and Response

The SHERP will include a plan to prevent and combat forest fires. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. The forest fire prevention plan will be followed by Nalcor and its contractors. The SHERP will address the following forest fire prevention measures and incident response procedures, as appropriate (i.e., seasonal considerations):

- appropriate and timely disposal of all flammable waste;
- the use of designated smoking areas;
- the burning of brush or debris will not be permitted;

- vehicles will be equipped with spark arrestors;
- the nearest regional office of the Department of Natural Resources (Forest Services Branch) will be notified prior to the initiation of work;
- in the event of a forest fire, immediate steps will be taken to contain or extinguish the fire to the extent practical and safe, and fires will be reported immediately to the nearest regional office of the Forest Services Branch.

An Operating Permit will be obtained from the provincial Forest Services Branch. Operating Permits are issued under the *Forestry Act* and give recipients the permission to carry out logging or industrial operations during the forest fire season. The Project EPP will also include forest fire prevention measures and a response plan.

Fire-fighting equipment, as described in Table 5.10.1-1, that is suitable to the labour force and working conditions will be available at each worksite and will be in proper working condition, as required by the Operating Permit. Fire-fighting equipment will comply with the standards of, and have approvals of, Underwriters Laboratories of Canada Limited and will be maintained in accordance with National Fire Protection Association Codes. Nalcor will ensure that all Project field personnel are trained in the use of fire-fighting equipment and that trained personnel are available to respond immediately to an incident.

Nalcor will require that its contractors have fire-fighting expense coverage as part of the Commercial General Liability requirement. This coverage will have a minimum limit of $250,000 for costs associated with the requirement for additional support (i.e., if a fire cannot be contained by the contractor). Detailed information on fire-fighting equipment and procedures will be provided in the SHERP, the EPP and other environmental documents, such as terms and conditions of permits and authorizations.

Table 5.10.1-1 Required Forest Fire Suppression Equipment

Number of Employees at Worksite	Backpack Pumps	Axes	Grubbers or Shovels
5 or less	1	1	1
6 – 10	2	2	2
11 – 15	3	3	3
16 – 20	4	4	4
Over 20	Add one backpack pump, one axe and two grubbers or shovels to the above numbers for each group of five additional employees or fraction of that number of employees. The backpack pump must have a capacity of 20 litres (L) and be of a type approved by the provincial Forest Service Branch.		

Note: This table shows the ratio of forest fire suppression equipment required by an operating permit issued under section 13, subsection (1) of the *Forest Fire Regulations* under the *Forestry Act.*

The Forest Services Branch is responsible for the province's fire suppression program. The Forest Services Branch operates six CL-215 Air Tankers and a Cessna spotter. Four Bell 206L Long Ranger helicopters are on full-time standby and others are hired as needed. There are approximately 100 fire suppression field staff employed by the Forest Services Branch located at 26 depots throughout the province. Forest fire co-ordination is handled by a Duty Officer for each region who oversees the initial attacks and deploys equipment as required (Newfoundland and Labrador Department of Natural Resources (NLDNR) 2011, internet site).

For co-ordination of fire-fighting, the province is divided into three Regions: Eastern Newfoundland, Western Newfoundland, and Labrador. The Eastern regional office is located in Gander, the Western office is located in Corner Brook, and the Labrador office is located in North West River. The current resources in Newfoundland include four water bombers located in Deer Lake (1), Gander (2), and St. John's (1), and two helicopters. Water bombers stationed in Happy Valley-Goose Bay and in Labrador City are available for forest fire response on the Island, if required. The current resources available in Labrador include: two standby helicopters, one water bomber stationed in Happy Valley-Goose Bay and one stationed in Labrador City. The four additional water bombers located on the Island are available for forest fire response in Labrador, if required.

5.10.2 Risk Evaluation

In 50 years of constructing, and operating and maintaining transmission and distribution lines, Nalcor is aware of only one incident where a forest fire was caused by its activities. This incident occurred in 2001 during the Avalon Transmission Upgrade Project in the area of Spread Eagle (15 km west of Whitbourne). This fire affected less than 1 hectare (ha) of forest and was extinguished by a single pass of a water bomber.

Forest fires occur with relatively low frequency in the province. Nevertheless, an average of 55 forest fires have occurred on the Island each year over the past decade, and an average of 45 forest fires have occurred in Labrador each year over the past decade (Sullivan 2010, pers. comm.). Although the incidence of fires is fairly equal between the Island and Labrador, the average size of fires in the two regions differs. The average extent of forest fires on the Island is less than 3.5 ha while the average extent of forest fires in Labrador is 470 ha (Sullivan 2010, pers. comm.). This difference is attributed to the Forest Services Branch's policy not to fight fires that do not threaten communities or harvestable resources (Michelin 2008, pers. comm.). Most fires within Labrador do not generate a response, while most fires are actively suppressed on the more densely populated Island. More information on forest fires in Newfoundland and Labrador is provided in Section 4.1.5.

In the experience of the Forest Services Branch, fought fires rarely exceed 100 ha (Michelin 2008, pers. comm.). However, there have been forest fires fought within the past ten years that have exceeded 1,000 ha on the Island and 30,000 ha in Labrador (Hewitt 2010, pers. comm.). Approximately half (47%) of the forest fires recorded in the past ten years (2000 to 2009) were resident-caused (e.g., grass burning), while 3.5% were attributed to industrial activity (e.g., mining camps, brush clearing) and 2.3% to forestry operations (Sullivan 2010, pers. comm.).

Vegetation type and season also influence the probability and extent of a forest fire. Approximately two thirds of the Labrador section of the transmission corridor crosses coniferous forest. On the Island, approximately half of the habitat crossed on the Northern Peninsula and through central Newfoundland, and less than one third of the habitat crossed on the Avalon Peninsula are coniferous forest. According to a study of the history of fire in the boreal forest of Southeastern Labrador (Foster 1983), forest fires occur from early June to late October, with peaks in ignition in late June and early July.

Based on the above information, the most likely event would be a small brush fire inadvertently started along the ROW or an access road during clearing operations. Nalcor is aware of only one small (less than 1 ha) forest fire that was caused by their activities. However, 3.5% of the forest fires fought by the Forest Services Branch in the past ten years were attributed to industrial activity. The implementation of the fire prevention procedures described in the SHERP will minimize the probability of a small brush fire occurring, but the probability of a fire occurring during ROW clearing activities remains moderate.

It is expected that the site response team would be able to contain and extinguish a small brush fire, and the affected area would likely be limited to the ROW. It is expected that monitoring or recovery initiatives would not be required, as fire is a natural event within the province. The consequence of a small brush fire therefore is low.

The moderate probability of occurrence and low consequence indicate a low risk of a small brush fire, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 11.2, 12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 16.3, 16.5 and 16.9).

5.10.3 Worst Case Scenario

The worst case scenario is a forest fire that cannot be contained by the site response crew. This scenario is more likely to occur during Project Construction than during Operations and Maintenance due to the higher level of activity along the ROW and access roads during construction. This scenario is most likely to occur during the summer, when the forest is driest. Given the Forest Services Branch's policy not to fight fires that do not threaten communities or harvestable resources, a forest fire in Labrador could affect large tracts of land. The average extent of forest fires in Labrador is approximately 470 ha (Sullivan 2010, pers. comm.). This scenario has a low probability of occurring, but has a moderate to high consequence with a resulting moderate risk. A similar fire in Newfoundland would be more actively fought but has a greater likelihood of approaching a populated community. The Newfoundland scenario has a low probability of occurring, but has a high consequence with a resulting moderate risk.

Consequently, two reasonable worst case scenarios are carried forward in the EIS: a forest fire affecting 470 ha of forested land in Labrador and a forest fire near a populated community in Newfoundland. Both fires are assumed to originate in the ROW or access road during Project Construction, during the summer. These scenarios will be addressed as specific events in Sections 11.4.2, 12.6.3, 13.4.3, and 16.10.2 of this EIS.

5.11 Waste Management Incidents

Several waste streams will be generated during Project Construction, and Operations and Maintenance, including domestic waste, sewage and wastewater, and industrial waste. Domestic waste from on-land construction will be temporarily stored in bear-proof containers at the temporary camps or work sites then transported by truck to an approved waste disposal or recycling facility. An on-site treatment system will be used to treat wastewater in Camps A, B, C, E, F, and possibly G. Camp D may use the wastewater treatment infrastructure at L'Anse au Loup. Waste generated by marine operations will be temporarily stored on board the vessel. Once docked, solid waste will be removed from the vessel and transported via truck to an approved waste disposal or recycling facility. Treatment and discharge of ship-board wastewater will comply with *Canadian Shipping Act* regulations.

Waste management incidents could include failure of the wastewater treatment system (e.g., a break in the sewage line) or a waste transport accident. A waste management incident may have the following environmental interactions:

- surface water contamination interactions with fish and aquatic habitats;
- interactions with human health if the material reaches an aquifer used for human consumption;
- alteration or loss of wildlife habitat;
- alteration or loss of vegetation; and
- soil contamination.

5.11.1 Incident Prevention and Response

The EPP will describe waste management procedures for the Project, including handling and disposal of domestic waste, industrial waste, and wastewater. The Project will comply with the requirements of the *Health and Community Services Act* (SN1997, plus amendments). Approval will be obtained for the wastewater treatment systems to be used at the temporary camps. For water and sewage systems with a capacity of less than 4,500 L per day (/day), approval will be obtained from the Government Services Centre regional office. For water and sewage systems with a capacity greater than 4,500 L/day, approval will be obtained from the NLDEC.

Wastewater disposal systems will comply with the *Department of Environment and Lands Act* (RSN1990, Chapter D-11, plus amendments), and the *Environmental Control Water and Sewage Regulations* (Consolidated

Newfoundland Regulations 1078/96 under the *Environment Act* (O.C. 96-254)). The tile field at the wastewater treatment facility will be clearly marked and vehicular traffic will not be permitted to operate within this defined boundary. Discharges will be monitored, as per permit requirements, to comply with effluent release standards (i.e., provincial Environmental Control Water and Sewage Regulations and Section 36 (3) of the *Fisheries Act*).

Waste management on marine vessels will comply with the Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals (SOR/2007-86) under the *Canada Shipping Act, 2001*. Wastewater will be treated prior to discharge and comply with the effluent release standards described in Section 129 (1) of the above-mentioned regulation.

On-land domestic garbage will be stored in bear-proof containers and regularly transported via waste handling truck to an approved waste disposal or recycling facility. Ship-board waste will be temporarily stored on the vessel, and transported from the port via waste handling truck to an approved waste disposal or recycling facility. Construction waste, including scrap metal, wood packaging, tires and various non-hazardous materials will be recycled, where possible. Construction waste will be temporarily stored along the ROW then transported to an approved waste disposal or recycling facility. Permission from the operator of the waste disposal facility will be obtained prior to disposal of any material.

5.11.2 Risk Evaluation

Nalcor has not experienced any Construction, or Operations and Maintenance incidents involving a collision or rollover of a waste disposal truck. The national average number of straight truck (greater than 4,500 kilograms (kg)) casualty collisions (i.e., collisions resulting in injury or mortality) between 2001 and 2005 was 4,792 per year. Straight trucks travelled an average of 7,395 million vehicle kilometres per year, so the average accident rate is 0.65 collisions per million kilometres (Transport Canada (TC) 2010). During the four year Project Construction period, there are expected to be less than 500 two-way trips between the construction sites and the various waste disposal sites. If the average distance between the work sites and the nearest approved waste disposal site is 100 km, it is unlikely that an accident involving a waste handling truck will occur (i.e., 0.065 collisions during Project Construction). These statistics include all casualty collisions but do not provide information on how many collisions resulted in the loss of cargo. The probability of a waste handling truck collision resulting in the release of solid waste to the environment is low.

The consequence of a collision involving a waste handling truck will depend on the severity of the accident (e.g., the contents of the load), the location of the accident (e.g., in the vicinity of a waterbody) and the time of year of the accident (e.g., fish spawning). In general, the consequence to the natural environment is likely to be low as solid waste will not travel far from the collision site, typically along a road or along the cleared ROW. The amount of solid waste spilled would be limited to the total capacity of one vehicle, approximately 40 cubic metres (m^3). The low probability and low consequence indicate a low risk of a solid waste handling incident, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, and 13.3).

The probability of a release of untreated wastewater into the environment is more challenging to estimate. There are no statistics available for sewage line breakage, or other events that could result in the release of untreated wastewater into the environment. A sewage line could break as a result of ground settling or damage from heavy equipment or vehicles. The failure or malfunction of a wastewater treatment system has resulted in the release of untreated wastewater into the environment once on a Nalcor project. The septic system at the Granite Canal construction site experienced some issues with the disposal field and drainage, and these issues were rectified in a timely manner. The probability of a release of untreated wastewater from the Project into the environment is therefore moderate.

The amount of untreated wastewater released due to a break in a sewage line would be limited by the capacity of the treatment system and the time required to detect and halt the flow. A wastewater release is most likely to occur during high use of the wastewater treatment system, which would be during evening hours (i.e., during the highest level of camp activity). Because a release of wastewater would occur within the camp perimeter, it is likely that the line breakage would be quickly detected. Based on a sewage production of 340 L per person per day (Newfoundland and Labrador Department of Government Services 2006) and a camp population of 150 persons, 4,250 L of untreated wastewater could be released in a two hour period.

Depending on the characteristics of the receiving environment, the release of 4,250 L of untreated wastewater could affect wildlife and vegetation near the spill. A decline in these resources may result, but resources would be expected to return to baseline levels and regional management initiatives or monitoring would likely not be required. The release of untreated wastewater is therefore likely to have a low consequence. The low probability of occurrence and low consequence indicate a low risk of a release of wastewater, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, and 13.3).

5.11.3 Worst Case Scenario

The worst case scenario is the release of 4,250 L of wastewater from one of the temporary camps during Project Construction that travels over land and into a waterbody or watercourse. This would affect fish and fish habitat in the vicinity of the spill as well as downstream from the spill. This scenario has a low probability of occurrence but a moderate consequence. As a result, it is considered to have a low risk, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.2, 12.3, 12.4, 12.5, 13.2, and 13.3).

5.12 Motor Vehicle Collisions

The operation of vehicles and heavy equipment on provincial highways, Project access roads and the ROW could result in human or wildlife collision mortality or injury. Human incidents may involve vehicle-vehicle collisions or vehicle-pedestrian collisions. The potential for these types of collisions is influenced by traffic volumes, weather conditions and pedestrian access.

Wildlife incidents may affect both large and small animals including birds, mammals and amphibians. Other wildlife-related incidents could occur as a result of vehicle travel over natural terrain (e.g., crushing nests or dens with young, or slow-moving animals). The potential for vehicle-wildlife interactions is influenced by the time of year (e.g., the spring and summer are sensitive breeding and nesting periods for birds; moose are moving more during the rut in September and October), the surrounding habitat type, and the time of day.

Vehicle collisions may have the following environmental interactions:

- human injury or mortality;
- wildlife injury or mortality;
- wildlife disturbance; and
- destruction of nests or dens.

5.12.1 Incident Prevention and Response

The SHERP will include safety measures for vehicle operation, including collision prevention. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. Driver / operator awareness programs will limit the potential for vehicle collisions, and other vehicle-wildlife incidents. The SHERP and driver awareness programs will address the following vehicle collision prevention measures:

- awareness of high potential collision areas, time of day and seasons; and

- speed restrictions on Project roads.

5.12.2 Risk Evaluation

Transport Canada maintains statistical data on Canadian motor vehicle collisions (MVCs). This includes information on the number of collisions, the number of fatalities and the number of injuries. Between 1990 and 2009, an annual average of 2,670 MVCs in Canada resulted in fatalities. An additional 150,000 MVCs resulted in injuries each year (TC 2011, internet site). The number of collisions reported from 1990 to 2009 in Canada that resulted in either fatality or personal injury is provided in Table 5.12.2-1.

Table 5.12.2-1 Canadian Motor Vehicle Traffic Collision Statistics, 1990 to 2009

Year	Number of Fatal Collisions	Number of Injury Collisions
1990	3,445	178,515
1991	3,225	170,693
1992	3,073	169,640
1993	3,121	168,106
1994	2,837	164,642
1995	2,817	161,950
1996	2,740	153,944
1997	2,660	147,549
1998	2,583	145,615
1999	2,632	148,683
2000	2,547	153,300
2001	2,413	148,996
2002	2,583	153,859
2003	2,489	150,545
2004	2,436	145,248
2005	2,551	145,603
2006	2,599	142,531
2007	2,462	138,632
2008	2,182	127,634
2009	2,011	123,192

Source: TC (2011, internet site).

In 2007, 447 moose-vehicle collisions were reported in the province (NLDEC 2010, internet site). Although moose-vehicle collisions can occur any time of year, more than 70% occur between May and October and most occur between dusk and dawn (NLDEC 2010, internet site). In most cases, these collisions resulted in moose fatalities.

During Project Construction, less than 100 vehicles will travel in any given day, and during Project Operations and Maintenance the number of Project vehicles in operation will be much less. Most Project vehicles will travel during daylight hours and speed restrictions will be imposed on Project access roads. These two factors will reduce the probability of vehicle collisions.

The consequence of a vehicle-vehicle or vehicle-pedestrian collision could range from vehicle damage to serious injury or death, that is from low to high. Given the frequency of MVC in Canada, the probability of a Project vehicle being involved in a vehicle-vehicle or vehicle-pedestrian collision that results in a low consequence is moderate. The probability of occurrence of a moderate to high consequence (i.e., serious injury or death) collision is low. The latter case indicates a moderate risk of vehicle-vehicle or vehicle-pedestrian collision. This scenario will be addressed as a specific event in Section 16.10.2 of this EIS.

The probability of a Project vehicle being involved in a wildlife collision involving small animals (e.g., birds, rodents) is considerably higher than one involving large animals. When small and large animals are considered together, the probability of a vehicle colliding with an animal is high. Vehicle-wildlife collisions often result in the death or injury of a single animal. As a result, collisions are not expected to have population level effects, so the consequence of a vehicle-wildlife collision is considered to be low. The high probability of occurrence and low consequence indicate a low risk of a wildlife collision, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.3, 12.4, 12.5).

5.12.3 Worst Case Scenario

The worst case scenario for a vehicle-vehicle or vehicle-pedestrian collision is one that results in multiple deaths. The probability of this worst case scenario occurring is much less than the probability of a collision resulting in vehicle damage or minor injury. The probability of occurrence depends on vehicle traffic volumes, pedestrian traffic volume, speed of travel, weather conditions (i.e., visibility) and personal factors such as seat belt use, fatigue, and alcohol use. Overall, this scenario is considered to have a low probability of occurrence, and the consequence of this incident is high. The low probability of occurrence and the high consequence indicate a moderate risk of a vehicle collision resulting in multiple deaths, as shown in Table 5.1.3-1. This scenario will be addressed as specific event in Section 16.10.2 of this EIS.

The worst case scenario for a vehicle-wildlife collision is the collision of a Project vehicle with an animal listed under the *SARA* or the *NLESA* or the destruction (e.g., driven over by a vehicle) of the nest or den of an animal listed under the *SARA* or the *NLESA*. The probability of this worst case scenario occurring is much less than the probability of a collision with a non-listed animal due to the relative abundance of listed and non-listed animals. The probability of occurrence depends on the species involved, their abundance, and their behaviour (e.g., feeding along roadsides, avoidance behaviours). Overall, this scenario is considered to have a low probability of occurrence. The consequence of this incident may be low to moderate, again depending on the species, its status and whether the incident involved an individual animal or a nest or den. The low probability of occurrence and the low to moderate consequence indicate a low risk of a vehicle colliding with a *SARA*- or *NLESA*-listed animal, as shown in Table 5.1.3-1. Proven and effective prevention and mitigation measures for this type of low risk incident are described within the Environmental Effects Assessment chapters of this EIS (Sections 12.3, 12.4, 12.5).

5.13 Marine Vessel Collisions

The operation of marine vessels in the Strait of Belle Isle could lead to a marine accident or incident. Vessel-vessel or vessel-ground collisions are influenced by marine traffic, weather conditions and vessel watch procedures. The potential for vessel-wildlife interactions is influenced by the time of year (e.g., many marine mammals migrate through the Strait of Belle Isle during the summer or fall), the surrounding habitat type, and the time of day. Marine vessel collisions may have the following environmental interactions:

- human injury or mortality;
- wildlife injury or mortality;
- wildlife disturbance;

- loss of habitat; and
- effects on marine water quality.

5.13.1 Incident Prevention and Response

The SHERP will include safety measures for vessel operation, including the prevention of wildlife collisions. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. Vessel operator awareness programs will limit the potential for wildlife collisions, and other vessel-wildlife incidents. The SHERP and vessel operator awareness programs will address the following vessel-wildlife collision prevention measures:

- awareness of high potential collision areas, time of day and seasons;
- reduction of marine vessel speed in areas of recent marine mammal sightings and likely high-density areas; and
- marine vessel observation procedures.

In addition, SIMOPS procedures and processes will be used. SIMOPS procedures will be developed by Nalcor to ensure safe and efficient operations of multiple vessels while working in the Strait of Belle Isle.

5.13.2 Risk Evaluation

The Transportation Safety Board of Canada (TSB) compiles statistical data on marine occurrences. Recordable occurrences include accidents or incidents associated with the operation of a ship and situations or conditions which, if left unattended, could induce an accident or incident.

Marine accidents include (but are not limited to) those in which a person sustains serious injury or is killed, the ship sinks, founders or capsizes, the ship is involved in a collision or the ship sustains fire or an explosion. In 2009, the TSB recorded a total of 390 marine accidents and 16 marine-related fatalities. The most frequent types of marine accidents are groundings, followed by fire and striking. Since 2000, 46% of vessels involved in marine accidents were fishing vessels. Bulk carriers and tugs / barges were the next most commonly affected vessel types, at 14% and 13%, respectively. A summary of marine accident statistics between 2000 and 2009 is provided in Table 5.13.2-1. In the Newfoundland region, an average of 68 accidents were recorded per year between 2000 and 2009. There were, on average, four marine-related fatalities per year in the Newfoundland region (TSB 2011a, internet site).

Table 5.13.2-1 Marine Accidents, 2000 to 2009

Accident Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Collision	16	16	15	24	12	20	19	13	17	15
Capsizing	15	6	14	11	18	10	18	12	13	8
Foundering / Sinking	38	37	26	30	18	21	24	20	32	22
Fire / Explosion	64	84	53	65	51	69	55	49	62	52
Grounding	123	114	129	118	108	87	112	95	71	110
Striking	68	89	72	76	82	81	62	61	57	50
Ice Damage	6	4	2	28	17	11	2	25	15	0
Propeller / Rudder / Structural Damage	31	19	42	39	36	43	56	41	15	16
Flooding	51	70	52	49	63	59	46	49	45	34
Other	38	20	43	41	37	43	27	32	34	31
Total	**450**	**459**	**448**	**481**	**442**	**444**	**422**	**397**	**361**	**338**

Source: TSB (2011a, internet site).

Incidents include (but are not limited to) situations such as a person falling overboard, a ship (100 gross tons or more) unintentionally contacting the bottom without going aground, a ship fouling a utility cable or underwater pipeline, or the ship sustaining a shifting of cargo or loss of cargo overboard. Between 2000 and 2009, the average number of incidents recorded per year was 228 (TSB 2011a, internet site). A list of the incidents recorded by the TSB, by incident type between 2000 and 2009, is provided in Table 5.13.2-2.

Table 5.13.2-2 Reportable Marine Incidents, 2000 to 2009

Incident Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Close-quarters Situation	57	60	29	60	67	56	30	21	20	12
Engine / Rudder / Propeller	105	99	57	83	106	85	112	90	129	124
Cargo Trouble	5	4	5	3	1	4	4	1	6	5
Personal Incidents	6	8	8	14	9	4	12	21	10	9
Other	75	68	76	64	65	78	58	95	83	78
Total	**248**	**239**	**175**	**224**	**248**	**227**	**216**	**228**	**248**	**228**

Source: TSB (2011a, internet site).

Marine vessels will be used for the installation of the submarine cable, and for rock berm construction. Cable laying and rock berm construction activities will be conducted primarily from slow-moving vessels with a high degree of manoeuvrability including redundant positioning systems. Vessel watch procedures will limit the potential for accidents in high traffic areas. All vessels in the field will complete a few tests to ensure they can be towed in case of a blackout which will include the provision of a standby vessel in case a tow is required. The probability of a vessel-vessel collision is considered low. The consequence of a vessel-vessel collision depends on the speed of travel, the size of the vessels involved, and the point / angle of collision. The consequence could range from low (e.g., vessel damage) to high (e.g., injury or death of personnel on board). The low probability of occurrence and the low to high consequence indicate a low to moderate risk of a vessel-vessel collision, as shown in Table 5.1.3-1. This scenario will be addressed as a specific event in Sections 14.6.3 and 16.10.2 of this EIS.

Wildlife incidents may affect both large and small animals including, but not limited to, whales, dolphins and porpoises. Vessel-wildlife collisions are not considered reportable to the TSB unless they lead to an accident or incident, as defined by the TSB. As a result, it is difficult to assess the probability of a vessel-wildlife collision occurring. The baseline studies conducted for this EIS will be used to identify potential high density marine wildlife areas, and vessel watch procedures will assist in the avoidance of vessel-wildlife collisions. The probability of a Project vessel being involved in a wildlife collision is therefore low. Vessel-wildlife collisions often result in the death or injury of a single animal. As a result, collisions are not expected to have population level effects, so the consequence of a vessel-wildlife collision is low. The low probability of occurrence and low consequence indicate a low risk of a wildlife collision, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 14.2, 14.3, 14.4, and 14.5).

5.13.3 Worst Case Scenario

The worst case scenario for a vessel-vessel collision is one that results in multiple deaths. The probability of this worst case scenario occurring is much less than the probability of a collision resulting in vessel damage. The probability of occurrence depends on marine traffic volumes (including fishing activity), weather conditions (e.g., visibility) and personal factors such as fatigue. Overall, this scenario is considered to have a low probability of occurrence, and the consequence of this incident is considered high. The low probability of occurrence and the high consequence indicate a moderate risk of a vessel collision resulting in multiple deaths, as shown in Table 5.1.3-1. This scenario will be addressed as a specific event in Section 16.9 of this EIS.

The worst case scenario for a vessel-wildlife collision is the collision of a Project vessel with an animal listed under the *SARA* or the *NLESA*. The probability of this worst case scenario occurring is much less than the probability of a collision with a non-listed animal due to the relative abundance of listed and non-listed animals. The probability of occurrence depends on the species involved, their abundance, and their behaviour (e.g., avoidance behaviours). Overall, this scenario is considered to have a low probability of occurrence. The consequence of this incident may be low to moderate, again depending on the species and its status. The low probability of occurrence and the low to moderate consequence indicate a low risk of a vessel colliding with a *SARA*- or *NLESA*-listed animal, as shown in Table 5.1.3-1. There are proven and effective prevention and mitigation measures for this type of low risk incident and these are described within the Environmental Effects Assessment chapters of this EIS (Sections 14.2, 14.3, 14.4, and 14.5).

5.14 Aviation Accidents

During Project Construction, helicopter transport may be used, in some areas, for material distribution. Where helicopters are used, the transmission towers may be assembled in marshalling yards or lay down areas and slung by helicopter to the ROW. In all slinging operations, there is a risk of dropped loads. Helicopters will be used for transmission line inspections during Project operation.

The Project is also located in a region used for low-level flight training by the Department of National Defence (DND). Flight training occurs at altitudes of 30 m above ground level and the transmission towers will reach a height of between 40 and 50 m. As a result, there is a risk of collision between DND aircraft and Project helicopter traffic, and between DND aircraft and the transmission towers and lines during both Project Construction, and Operations and Maintenance. Aviation accidents may have the following environmental interactions:

- human injury or mortality;
- wildlife injury or mortality;
- loss of wildlife habitat; and
- loss of vegetation.

5.14.1 Incident Prevention and Response

- Helicopter operation for Project Construction and operation (including slinging) will comply with Canadian Aviation Regulations (CARs). CARs regulate flight operations, and provides instruction on safety measures / limitations such as:
  - minimum visibility requirements for flight;
  - minimum fuel requirements;
  - weight and balance requirements;
  - pre-flight inspections and safety briefings;
  - horizontal and vertical distance that an aircraft must maintain if flight is conducted over a built up area; and
  - standards for slinging (e.g., requirement for a quick release mechanism and back-up in case of emergency).

Nalcor has provided Project description information to DND and has discussed with them the nature of ongoing military flight activities in the area. The discussion between Nalcor and DND also included potential concerns, future planning, and design and communication measures to prevent potential interactions between the Project and DND flight activity. Nalcor will continue to consult with DND during detailed Project design to identify issues related to tower design and transmission line routing and will address these issues, where possible, during the design process. Early communication with DND will also allow Project activities (i.e., helicopter traffic) and Project components (e.g., transmission towers) to be incorporated into DND's planning and navigation aids (e.g., charts).

Nalcor and / or its contractor(s) will also provide full and regular briefings to DND authorities regarding its planned and ongoing construction activities, particularly those involving aircraft activity in Labrador to ensure coordinated planning and communication around Project Construction activities. More information on that communication plan can be found in Section 16.5.

5.14.2 Risk Evaluation

The TSB compiles statistical data on aviation occurrences. Recordable occurrences include accidents or incidents associated with the operation of aircraft and situations or conditions which, if left unattended, could induce an accident or incident.

Aircraft accidents include those in which a person sustains serious injury or is killed, the aircraft experiences structural damage and requires major repair, or the aircraft is missing or inaccessible. In 2009, the TSB recorded a total of 297 aviation accidents, with a rate of 5.9 accidents per 100,000 flying hours. Of these 297 accidents, 215 involved airplanes, 32 involved helicopters, and the remaining 7 were balloons, gliders or gyrocopters. Between 2000 and 2009, Canadian registered aircraft were involved in an average of 31 fatal accidents per year. The average number of fatalities per year over the same ten year period was 54. The number of serious injuries recorded per year between 2000 and 2009 was 41 (TSB 2011b, internet site). A summary of the aircraft accident statistics between 2000 and 2009 are provided in Table 5.14.2-1. In Newfoundland and Labrador, an average of 6.5 accidents were recorded per year between 2000 and 2009. There was, on average, one fatal accident per year in Newfoundland and Labrador (TSB 2011b, internet site).

Table 5.14.2-1 Accidents Involving Canadian Registered Aircraft, 2000 to 2009

Accidents	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fatal accidents	38	33	31	32	24	34	31	33	26	28
Fatalities	65	59	51	60	37	55	52	49	51	64
Serious injuries	53	37	42	42	27	37	40	56	38	34
Total accidents	320	295	274	295	252	259	262	285	252	249
Hours flown (thousands)	3,982	3,885	3,713	3,790	3,961	3,979	4,059	4,180	4,432	4,171
Accident rate (per 100,000 hours)	7.8	7.4	7.2	7.5	6.2	6.4	6.5	6.8	5.5	5.9

Source: TSB (2011b, internet site).

Incidents include (but are not limited to) situations such as engine failure, transmission gearbox malfunction, fire, fuel shortage, and the inadvertent or emergency release of a sling load. Between 2000 and 2009, the average number of incidents recorded per year was 674 (TSB 2011b, internet site). A list of incidents recorded by the TSB, by incident type between 2000 and 2009 that involved Canadian registered aircraft, is provided in Table 5.14.2-2.

Table 5.14.2-2 Incidents involving Canadian Registered Aircraft by Incident Type, 2000 to 2009

Incidents	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Risk of collision / Loss or separation	130	170	169	123	182	150	150	152	149	137
Declared emergency	174	208	231	229	204	152	184	186	235	236
Engine failure	129	157	134	104	118	116	106	108	98	93
Smoke / fire	71	92	83	82	81	85	86	106	90	84
Collision	8	17	19	16	21	8	18	9	7	7
Control difficulties	25	28	28	41	41	41	31	38	32	18
Crew unable to perform duties	15	13	37	48	51	67	56	63	74	57
Dangerous goods-related	2	6	0	2	0	1	2	3	1	3
Depressurization	4	15	18	17	7	12	9	11	15	3
Fuel shortage	1	2	1	6	10	5	6	4	4	4
Failure to remain in landing area	13	4	6	3	10	10	6	7	16	8
Incorrect fuel	0	0	1	0	2	1	1	0	1	0
Slung load released	6	8	3	4	5	1	3	3	5	3
Transmission or gearbox failure	2	2	2	1	2	1	0	1	0	3
Total	**580**	**722**	**732**	**676**	**734**	**650**	**658**	**691**	**727**	**656**

Source: TSB (2011b, internet site).

The extent to which helicopters will be used for material distribution during Project Construction has not been finalized, nor has the extent transmission line inspections will be conducted from the air during Project operation. As a conservative estimate for inspections, the assumption is for 100% use of helicopters. The average accident rate for Canadian registered helicopters between 2000 and 2009 was 7.5 per 100,000 hours of flight time (TSB 2011b, internet site). Considering the limited use of helicopters for the Project, the probability of an accident occurring is low.

Similarly, helicopter slinging operations may be used for some material distribution during construction, but the extent to which will this occur has not been finalized. The average rate of inadvertent or emergency sling load releases in Canada between 2000 and 2009 was four per year. The probability of this occurring during Project Construction is therefore low.

An aviation accident may have a high consequence as it could result in serious injury or death of the passengers. Either an aviation accident or released sling load also has the potential to harm the members of the public, if it occurs in a populated area.

The low probability of occurrence and high consequence indicate a moderate risk of an aviation accident, as shown in Table 5.1.3-1. This scenario will be addressed as a specific event in Section 16.10.2 of this EIS.

5.14.3 Worst Case Scenario

The worst case scenario is an aviation accident or released sling load within a populated area. Given the prevention measures described above, the probability of this occurring is low. The consequence of this worst case scenario (i.e., serious injury or death) is high. The low probability of occurrence and the high consequence indicate a moderate risk of an aviation accident or released sling load within a populated area, as shown in Table 5.1.3-1. This scenario will be addressed as a specific event in Section 16.10.2 of this EIS.

5.15 Summary

Table 5.15-1 summarizes the potential accidents and malfunction incidents that may occur during Project Construction, and Operations and Maintenance. For each incident, one or more reasonable worst case scenarios are identified. Project activities that could result in the incident and summaries of the risk of the incident occurring are listed in Table 5.15-1. Each low risk incident is addressed as part of the overall environmental effects assessment of the relevant VECs. Each moderate to high risk incident is addressed within the Accidents and Malfunctions section of Environmental Effects chapter for relevant VECs. The EIS sections that address each type of incident are identified in Table 5.15-1.

Table 5.15-1 Summary of Accidents and Malfunctions

Potential Incident	Project Activity	Incident Description	Probability	Consequence	Risk	EIS Section
Transmission Tower Failure	**Project Construction**: tower erection, conductor installation **Project Operations and Maintenance**	Failure of a single transmission tower during construction	Low-moderate	Low	Low	12.2, 12.3, 12.4, 12.5, 13.3, 16.3
		Failure of multiple transmission towers during conductor installation or Project Operations	Low	Low to Moderate	Low	12.2, 12.3, 12.4, 12.5, 13.3, 16.3
		Worst case scenario: Failure of 20 transmission towers	Low	Moderate	Low	12.2, 12.3, 12.4, 12.5, 13.3, 16.3
Electrocution	**Project Operations and Maintenance**	Human contact with transmission lines, submarine cable, electrodes	Low	High	Moderate	16.10.2
		Wildlife contact with transmission lines, submarine cable, electrodes	Moderate	Low	Low	12.3, 13.3, 14.3
		Worst case scenario: Death of a person	Low	High	Moderate	16.10.2
		Worst case scenario: Death of a *SARA*-listed or an *NLESA*-listed animal	Low	Low to Moderate	Low	12.3, 13.3, 14.3
Spills and Leaks of Hazardous Materials	**Project Construction**: use and handling of hazardous materials during construction activities, operation of heavy equipment and marine vessels, concrete production **Project Operations and Maintenance**: vegetation control, operation of vehicles and equipment	Small spill (less than 2 L)	High (during Construction) Low (during Operations and Maintenance)	Low	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, 14.4, 14.5
		Worst case scenario: spill of 1,000 L of diesel fuel during construction that spills over the ground and into a watercourse	Low	Moderate to High	Moderate	11.4.2, 12.6.3, 13.4.3, 14.6.3, 16.10.2
		Worst case scenario: large fuel spill into the Marine Environment, during construction, due to vessel collision	Low	High	Moderate to high	14.6.3, 16.10.2

Table 5.15-1 Summary of Accidents and Malfunctions (continued)

Potential Incident	Project Activity	Incident Description	Probability	Consequence	Risk	EIS Section
Frac-out During Horizontal Directional Drilling	**Project Construction**: horizontal directional drilling for submarine cables	Release of drilling mud to the terrestrial or Marine Environment.	Low	Low	Low-moderate	12.2, 14.2, 14.3
		Worst case scenario: release of drilling mud to the Marine Environment that results in smothering of fish eggs, benthic invertebrates and marine plants or release of drilling mud to the Terrestrial Environment in a location where listed plants are present	Low	Low	Low	12.2, 14.2, 14.3
Slope Failure	**Project Construction:** transmission tower foundation construction, access road construction, electrode site construction **Project Operations and Maintenance**	Localized slope failure	Low	Low	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, 14.4, 14.5
		Worst case scenario: slope failure during construction that affects a riverbank or the marine coast	Low	Low to Moderate	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 14.2, 14.3, 14.4, 14.5
Fires (except forest fires)	**Project Construction**: storage of combustible materials or waste, operation of camp kitchen **Project Operations and Maintenance**: storage of combustible materials or waste, equipment malfunction	Small, contained fire	Low	Low	Low	11.2, 12.2, 12.3, 12.4, 12.5
		Worst case scenario: forest fire	Addressed as separate incident – forest fires			

Table 5.15-1 Summary of Accidents and Malfunctions (continued)

Potential Incident	Project Activity	Incident Description	Probability	Consequence	Risk	EIS Section
Forest Fires	**Project Construction**: operation of combustion engines, blasting, smoking workers **Project Operations and Maintenance**: operation of combustion engines, smoking workers	Small brush fire along access or ROW	Moderate	Low	Low	11.2, 12.2, 12.3, 12.4, 12.5, 13.2, 13.3, 16.3, 16.5, 16.9
		Worst case scenario: forest fire affecting 470 ha in Labrador, originating in the access or ROW, during the summer	Low	Moderate to High	Moderate	11.4.2, 12.6.3, 13.4.3, 16.10.2
		Worst case scenario: forest fire in the vicinity of a populated community in Newfoundland, originating in the access or ROW, during the summer	Low	High	Moderate	11.4.2, 12.6.3, 13.4.3, 16.10.2
Waste Management Incidents	**Project Construction:** wastewater treatment, waste transport	Solid waste spill resulting from collision of waste handling vehicle	Low	Low	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3
		Release of untreated wastewater, up to 4,250 L	Low	Low	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3
		Worst case scenario: release of 4,250 L of wastewater into a watercourse	Low	Moderate	Low	12.2, 12.3, 12.4, 12.5, 13.2, 13.3

Table 5.15-1 Summary of Accidents and Malfunctions (continued)

Potential Incident	Project Activity	Incident Description	Probability	Consequence	Risk	EIS Section
Motor Vehicle Collisions	**Project Construction** and **Project Operations and Maintenance**: operation of vehicles and heavy equipment on provincial highways, access roads and the ROW	Vehicle-vehicle or vehicle-pedestrian collision	Low to Moderate	Low to High	Low to Moderate	16.10.2
		Vehicle-Wildlife Collision	High	Low	Low	12.3, 12.4, 12.5
		Worst case scenario: collision resulting in multiple human deaths	Low	High	Moderate	16.10.2
		Worst case scenario: collision with a *SARA*-listed animal, an *NLESA*-listed animal, or nest / den of a listed animal	Low	Low to Moderate	Low	12.3, 12.4, 12.5,
Vessel Collisions	**Project Construction**: materials transport vessels, fallpipe vessel, CIV **Project Operations and Maintenance**: submarine cable inspection vessels	Vessel-vessel collision	Low	Low to High	Low to Moderate	14.6.3, 16.10.2
		Vessel-wildlife collision	Low	Low	Low	14.2, 14.3, 14.4, 14.5
		Worst case scenario: vessel collision resulting in multiple human deaths	Low	High	Moderate	14.6.3, 16.10.2
		Worst case scenario: collision with a *SARA*-listed animal or an *NLESA*-listed animal	Low	Low to Moderate	Low	14.2, 14.3, 14.4, 14.5
Aviation Accidents	**Project Construction**: materials distribution **Project Operations and Maintenance**: transmission line inspection, low-level DND flight training	Aviation accident (e.g., collision with transmission line structures, collision with ground, dropped sling load)	Low	High	Moderate	16.10.2
		Worst case scenario: aviation accident within a populated area	Low	High	Moderate	16.10.2

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 6

Environmental Setting and Context

April 2012

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LIST OF ACRONYMS

Acronym	Description
%	percent
2D	two dimensional
ACCDC	Atlantic Canada Conservation Data Centre
BP	before present
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
GIS	Geographic Information System
km	kilometre
km^2	square kilometres
kV	kilovolt
m	metre
MW	megawatt
NAFO	Northwest Atlantic Fisheries Organization
NCC	NunatuKavut Community Council (formerly the Labrador Métis Nation)
Project	Labrador-Island Transmission Link
ROW	right-of-way
TCH	Trans-Canada Highway
TL	Transmission Line (when referring to specific line number)
TLH	Trans-Labrador Highway
TLH3	Trans-Labrador Highway Phase 3

6 ENVIRONMENTAL SETTING AND CONTEXT

The proposed transmission corridor will extend across a considerable portion of Newfoundland and Labrador, including the Strait of Belle Isle, and through a variety of natural and human environments.

The following sections present a general and high-level overview of the Labrador-Island Transmission Link (Project) existing environmental setting for the Labrador-Island Transmission Link, as overall background and context for the Project and its environmental assessment (EA), and to set the stage for the identification of potential environmental issues and the environmental effects assessment.

More detailed descriptions of the existing biophysical and socioeconomic environments are provided later in the Environmental Impact Statement (EIS) (in Chapters 10 and 15, respectively). These should be referred to for further detail, including the sources of the information summarized below. Detailed information on the existing environment is presented in the component studies for the Project.

6.1 The Natural Environment

Newfoundland and Labrador is the easternmost province of Canada, and consists of the Island of Newfoundland (111,390 square kilometres (km^2)) and Labrador (294,330 km^2), which is located to the north-west of the Island on the Canadian mainland. The Strait of Belle Isle divides the province into these two geographical components.

6.1.1 Central and Southeastern Labrador

The Labrador component of the proposed transmission corridor extends from the lower Churchill River at the proposed Muskrat Falls converter station, and across Southeastern Labrador to the Strait of Belle Isle, for a distance of approximately 400 kilometres (km).

6.1.1.1 Climate, Topography and Vegetation

As a result of its northern location and its combination of inland and maritime characteristics, the climatic characteristics of Central and Southeastern Labrador vary from a continental regime in the low-lying interior characterized by warm summers and long, cold winters, to warmer winters and cooler summers with abundant precipitation on the coast.

The region lies on the eastern edge of the Canadian Shield, a vast area of Precambrian rock that forms the central core of the North American continent. The Project lies in the Grenville Province, which extends along the southern edge of the Shield and is comprised mainly of felsic metamorphic rocks.

The area of Labrador crossed by the Project exhibits a varied topography. The area immediately surrounding the lower Churchill River is comprised primarily of undulating upland topography and coastal plain, with flat river terraces. The lower Churchill River valley is highly productive, with boreal plant species assemblages including large conifers such as white and black spruce and balsam fir, and associated deciduous species and understory vegetation typical of the boreal forest.

Moving south-east, the landscape is initially characterized by rolling terrain and broad river valleys covered by shallow till and glacial landforms such as drumlins and eskers. The vegetation is comprised mostly of fairly open black spruce forests, with extensive ribbed fen and string bog complexes, and sporadic hardwoods and lichen-covered wooded areas on drier sites.

Further inland, the Eagle River Plateau occupies much of the area between Lake Melville and the coast. This flat to rolling upland area is comprised of large peatlands, interrupted by glacial landforms and shallow river valleys. Extensive string bogs with considerable open water are surrounded by fen vegetation dominated by sedge grasses and moss. Patches of scrub black spruce and associated plants and mosses are also interspersed throughout.

Along the coastal strip adjacent to the Strait of Belle Isle, low hills are covered primarily with barren vegetation and pockets of scrub spruce and bog.

6.1.1.2 Wildlife

The lower Churchill River valley supports a variety of wildlife species that reside there year-round, seasonally, or use the waterway as a travel route. Mammal species that use the river and valley include beaver, porcupine, muskrat, mink and otter. Large mammals that use the valley for shelter and / or as a travel corridor include caribou, moose and black bear. Waterfowl species include common loons, Canada geese and black ducks.

The interior of Southeastern Labrador, with its open, stunted forests and extensive wetlands, also provides habitat for a range of wildlife species. Caribou numbers are generally low, and other large mammals such as moose and black bear are found in low to moderate densities, particularly in association with forested river valleys. The area supports furbearer and small mammal species such as marten, snowshoe hare, porcupine and voles, as well as upland game birds including ptarmigan and grouse. Raptors are found in the region, particularly in the breeding season, and waterfowl often inhabit the large waterbodies and extensive wetland areas throughout this area during the open water season. A variety of passerine bird species are also present, many of them migrants that come to Labrador to breed.

There are three recognized boreal populations of woodland caribou in Labrador – the Red Wine, Mealy Mountains and Lac Joseph herds, each of which is currently listed as threatened under provincial and federal legislation. A small population of woodland caribou which are currently believed to be associated with the Mealy Mountains herd have also been located in the Joir River area of southern Labrador.

6.1.1.3 Freshwater and Marine Environments

The Labrador section of the proposed transmission corridor will cross and / or be located adjacent to a number of watersheds, including the Churchill, Kenamu, Mecatina, St. Augustine, St. Paul, Pinware and Forteau rivers. Watercourse crossings range in size from small, seasonal or intermittent streams to much larger rivers. Fish species which are known to occur in the region include: Atlantic salmon, brook trout, lake trout, lake whitefish, round whitefish, longnose sucker, white sucker, northern pike, lake chub, burbot, pearl dace, stickleback, sculpin, rainbow smelt, Arctic char and American eel. There are several Scheduled Salmon Rivers in this general area.

6.1.2 Strait of Belle Isle

The Strait of Belle Isle is a marine channel that separates the south-east coast of Labrador from the north-west portion of the Island of Newfoundland, extending for approximately 118 km in a north-east to south-west direction. At its narrowest point the Strait is approximately 17 km wide, between Point Amour and Yankee Point near the south-west end.

6.1.2.1 Physical Environment

The coast along the Labrador side is steep and rises to flat-topped ridges and summits from approximately 300 to 400 metres (m) above sea level, while the Newfoundland coast is much lower with shorelines rising to approximately 30 m. Water depths within the Strait of Belle Isle vary significantly, and reach over 120 m in places. In the general Project vicinity, water depths are greater on the Labrador side and with pronounced drop-offs, while the Island side is comparatively shallow with depths increasing more gradually.

The Strait is underlain by Precambrian gneisses that belong to the Grenville Province and consist of a complex of metamorphic and granitic rocks. The Strait of Belle Isle is topographically complex, with seabed sediments consisting of thin, discontinuous glacial and marine sediments overlying bedrock. Across most of the Strait, the seabed comprises coarse-grained armour of pebbles, cobbles and boulders overlying glacial till and localized glaciomarine deposits. Marine sands form a discontinuous surficial veneer in shallow water areas and are thicker locally in some coastal embayments. Bedrock is exposed at the seabed in places.

Water movement through the Strait of Belle Isle is primarily through strong tidal currents. The inshore branch of the Labrador Current flows south-westerly into the Strait and along the Labrador coast before entering the Gulf of St. Lawrence. Warmer and less saline water from the Gulf of St. Lawrence flows north-easterly into the Strait along the coast of Newfoundland. The turbulence and mixing created by these water masses and movements creates an area of nutrient-rich water and quite high productivity.

Sea ice in the Strait of Belle Isle is a combination of locally formed ice and pack ice that drifts down from the Arctic and Labrador Sea. Icebergs drift into the Strait each year, with the largest number observed in May and June. Iceberg grounding and associated seabed scouring occur seasonally.

6.1.2.2 Marine Fish and Wildlife

A variety of fish species are present in the Strait of Belle Isle, including shellfish such as scallop, lobster, whelk and toad crab, groundfish such as cod, lumpfish, flounder and halibut, and pelagic species such as capelin, squid, herring, salmon and mackerel, as well a range of benthic invertebrates.

Marine mammals, including whales, porpoises, dolphins and seals, are present in the Strait of Belle Isle at specific times of the year, particularly in summer, although spatial and temporal distribution varies considerably between species.

The Strait of Belle Isle is also used by a variety of avifauna for breeding, overwintering and / or as feeding and resting areas during migration through the area. Marine birds and waterfowl often congregate on the rounded headlands along the Strait as they move along the coast.

6.1.3 Island of Newfoundland

The proposed transmission corridor on the Island of Newfoundland extends from the Strait of Belle Isle, down and across the Northern Peninsula, through Central and Eastern Newfoundland, and on to the north-eastern portion of the Island's Avalon Peninsula, a distance of approximately 700 km, ending with a converter station at Soldiers Pond.

6.1.3.1 Northern Peninsula

The Northern Peninsula is the Island's largest peninsula, approximately 300 km long and 80 km at its widest point and comprising an area of 17,500 km^2.

The north-western edge of the peninsula, along the Strait of Belle Isle, is a rocky, flat coastal stretch. Calcareous bedrock is common, and the area is covered by shallow soils with extensive areas of exposed bedrock. The vegetation cover is comprised almost exclusively of barren and tundra-like assemblages, with alternating dry barrens and shallow fens. The calcareous barrens are home to a rich and unique mixture of endemic, arctic and calciphillic plant species, a number of which are protected under provincial and / or federal legislation may be found in the general area.

Along the western side and interior portions of the Northern Peninsula, coastal, forested and barren areas are present. Much of the interior is dominated by mountainous highland areas and plateaus associated with the Long Range Mountains, with mostly barren vegetation and shallow ribbed fen and tuckamoor dominating the landscape. Along the western edge of the peninsula, the lower portions of the Long Range Mountains are characterized by forested areas along the slopes and a flat coastal plain supporting bogs and scrub vegetation.

The region is home to a number of woodland caribou aggregations, as well as other large and small mammals such as moose, black bear, fox, hare and others that occupy the forest, scrub and aquatic habitats throughout the peninsula. Raptors, waterfowl and other avifauna are also found here, including Bald Eagle, Osprey and Merlin in the forested areas, ptarmigan and grouse in the barrens and scrublands and geese, ducks and mergansers in the wetland areas along the coast.

This section of the proposed transmission corridor will also cross and / or be located adjacent to a number of watersheds, which are known to support a variety of fish species. Fish species that commonly occur in waterbodies and watercourses in the region include Atlantic salmon, brook trout, rainbow smelt, stickleback and American eel, with occasional Arctic char. There are Scheduled Salmon Rivers in the general area, including several that are crossed by the proposed transmission corridor.

6.1.3.2 Central and Eastern Newfoundland

This region exhibits the most continental climate on the Island, with comparatively high summer temperatures, low rainfall and harsh winters. The topography is predominantly low and rolling. This is the most heavily forested and distinctly boreal area of Newfoundland, with pure black spruce forests, and white birch and aspen stands, as well as dwarf shrub heath.

Wildlife in this region are typical of the boreal forest, and include moose, snowshoe hare, black bear, beaver, and lynx, as well as small mammals such as voles and shrews. Caribou exist in the general area including near the base of the Northern Peninsula in the White Bay area and to the south-east. Birds that typically live in forested areas are also found throughout, including raptors such as Bald Eagle, Osprey, Merlin, Boreal and Sharp-shinned Hawk, as well as Great Horned Owls and upland game birds such as Ruffed and spruce Grouse. Waterfowl such as Green-winged Teal, Ring-necked Duck and Canada Geese are also present.

Fish species that are common in waterbodies and watercourses in the region include Atlantic salmon, brook trout, rainbow smelt, stickleback, American eel and Arctic char, with rainbow trout, alefish and sea lamprey occurring less commonly. Major river systems such as the Exploits, Gander, Gambo and Terra Nova Rivers are located in this region, some of which are designated as Scheduled Salmon Rivers.

6.1.3.3 Avalon Peninsula

As the proposed transmission line corridor nears the Avalon Peninsula, it passes through an area of extensive maritime barrens. The isthmus and the western and northern portions of the Avalon Peninsula are characterized by undulating terrain with extensive areas of barren heath, small pockets of forest in sheltered valleys (particularly in the north), and bogs and shallow fens interspersed throughout.

The sheltered, central portion of the Avalon Peninsula is characterized by low elevations and hilly terrain with numerous lakes and bogs. This area experiences cool summers and mild winters, high precipitation and frequent fog. The region is forested, and exhibits distinctive vegetation patterns which include pure stands of balsam fir–fern forests with a mixture of yellow birch, scrub black spruce forests with peatmoss understory and ericaceous shrubs, and convex raised bogs. Lichens are abundant on tree stems and branches.

The barren and bog areas and forested pockets on and adjacent to the Avalon Peninsula are home to a number of large and small mammals such as moose, black bear, lynx, fox, hare, mink, beaver, otter, voles and shrews. In addition, raptors, waterfowl and other avifauna are found throughout this region's barren, forest, scrub, wetland and marine habitats. The barren areas are also home to a number of caribou aggregations, particularly the northern and southern portions of the peninsula.

Fish species that are known to commonly occur in waterbodies and watercourses on the Avalon Peninsula include Atlantic salmon, stickleback, brook and brown trout, rainbow smelt and American eel, with rainbow trout, Arctic char and other species found less commonly.

6.2 The Human Environment

As described previously, the Project will extend through much of Newfoundland and Labrador, and will therefore cross and potentially interact with a range of socioeconomic environments and communities.

6.2.1 Central and Southeastern Labrador

Labrador has a rich history and cultural heritage. Today, nearly 30,000 people live in Labrador, distributed in some 30 communities which range from small settlements along the coast to larger centres in central and western Labrador.

6.2.1.1 Historical Overview and Archaeology

Archaeological research in Labrador has revealed a cultural-historical sequence that is long and complex, beginning with the arrival of Maritime Archaic groups in south-eastern Labrador by 8,000 years before present (BP), and culminating with the arrival of the Thule, ancestors of the modern Labrador Inuit, approximately 700 years BP. Archaeological and historical records also confirm a lengthy European presence throughout the region.

Previous archaeological research in Labrador has focused primarily on the coast, and has generally established that historic resources in these areas are rich and abundant, particularly along the shoreline within the major bays. There appears to be a clear distinction between the relatively high archaeological potential of the Strait of Belle Isle coastal strip and the generally lower potential of the interior.

6.2.1.2 Contemporary Socioeconomic Setting

Labrador encompasses a vast area with diverse social, cultural and economic landscapes, and is often thought of as being comprised of a number of regions - Central Labrador, Southern Labrador, the Labrador Straits, Labrador West and the North Coast. The Project itself will extend through two of these regions – Central Labrador and the Labrador Straits, referred to in this EIS as the Central and Southeastern Labrador study region.

Central Labrador (or Upper Lake Melville) includes the Town of Happy Valley-Goose Bay, the Town of North West River, the Innu reserve community of Sheshatshiu and the smaller settlement of Mud Lake. The region has a population of just over 9,000 people, approximately one-third of the population of Labrador. Happy Valley-Goose Bay is the largest community in Labrador and has a well-developed and diverse economy, and a range of services and infrastructure. The communities of North West River and Sheshatshiu are located approximately 25 km north-east of Happy Valley-Goose Bay, and also include a number of businesses and service agencies, while Mud Lake is about 10 km to the south-east.

Happy Valley-Goose Bay, North West River and Sheshatshiu are connected to each other by a paved road, whereas Mud Lake is accessed by boat and snowmobile. The Trans-Labrador Highway (TLH) (Phase 1) also connects the region to Labrador West and beyond, and since opening in 2009, the TLH Phase 3 (TLH3) provides year-round road access to Southern Labrador and on to the Labrador Straits. Year-round air service and seasonal ferry services to coastal Labrador and the Island of Newfoundland are also available.

The Labrador Straits is the region across the Strait of Belle Isle from the Island of Newfoundland. It includes the communities of L'Anse au Clair, Forteau, L'Anse Amour, L'Anse au Loup, Capstan Island, West St. Modeste, Pinware and Red Bay, and has a population of just less than 2,000 persons.

The economy of the Labrador Straits region has traditionally been based on the fishery, but the area has also seen a considerable expansion in the number and diversity of small businesses in recent years. The tourism sector also contributes greatly to the economy of the region, with a number of important natural and historic attractions. Communities in the region are connected to each other and to the Québec North Shore by a paved highway which was constructed in the 1950s. The TLH Phase 2, constructed in the late 1990s, extends from Red Bay north to Cartwright, and a ferry service between Blanc-Sablon and St. Barbe connects the area to the Island of Newfoundland.

Adjacent to the proposed transmission corridor, Southern Labrador is the region between Groswater Bay and Cape Charles. It includes the towns of Cartwright, Charlottetown, Port Hope Simpson, St. Lewis and Mary's

Harbour, and the communities of Paradise River, Black Tickle-Domino, Norman Bay, Pinsent's Arm, Williams Harbour and Lodge Bay. There are also a number of smaller coastal settlements in the region which are inhabited on a seasonal basis.

A number of Aboriginal communities and organizations reside in or near these regions, and undertake land use and harvesting activities and / or claim Aboriginal rights or title to portions of Labrador, including:

- Innu of Labrador, who currently number about 2,500 and reside primarily in two communities - Sheshatshiu in Central Labrador and Natuashish on the North Coast. The Innu claim Aboriginal rights and title to much of Labrador. Agreements related to these land claims and the proposed Lower Churchill and existing Upper Churchill projects were recently concluded and ratified by the Innu people on June 30, 2011, and signed by all relevant parties on November 18, 2011.
- Labrador Inuit, who are primarily resident on the Labrador North Coast in the communities of Nain, Hopedale, Makkovik, Postville and Rigolet, and in various Central Labrador communities. The *Labrador Inuit Land Claims Agreement* came into effect on December 1, 2005, and resulted in the establishment of the Nunatsiavut Government.
- Québec and Naskapi groups, including those that reside on the Lower North Shore and in the Schefferville area. The land claim areas of several of these First Nations extend into Labrador, including: Pakua Shipi (St. Augustine), Unamen Shipu (La Romaine), Nutashkuan (Nastashquan), Ekuanitshit (Mingan), Uashat mak Mani-Utenam (Sept-Îles), Matimekush-Lac John (Schefferville) and Kawawachikamach. The land claims asserted by Québec First Nations for territory in Labrador have not been accepted for negotiation by the Government of Newfoundland and Labrador. Québec Innu and Naskapi people are known to undertake land use and harvesting in certain parts of Labrador.
- NunatuKavut Community Council (NCC, formerly the Labrador Métis Nation), an organization that reports a membership of over 6,000 members who reside primarily in Southern and Central Labrador. Originally established as the Labrador Métis Association in 1985, the NCC has asserted a land claim in the region, but this has not been accepted for negotiation by the federal or provincial governments.

A variety of land and resource use activities are undertaken in the general region, including recreational, subsistence and commercial pursuits by Aboriginal and non-Aboriginal persons. Large and small game are found throughout the area, and hunting has long been an integral part of the lifestyle of area residents. Trapping was historically an important economic activity, but today is pursued primarily for recreation and / or as a supplementary income source. Residents harvest the region's forest resources for firewood and lumber. Fishing is an important recreational and subsistence activity, with salmon, trout, pike, smelt and / or other fish species taken from numerous rivers and ponds through angling and net fisheries.

Cabins are located throughout the area, and are used in association with various recreational and subsistence pursuits. Snowmobiling is a popular activity in the winter months. Local trail networks are also used by residents for hunting, fishing and gathering activities. There are also commercial outfitting camps throughout Labrador, which offer big game hunting, angling and / or ecotourism adventures, including several fishing lodges located throughout Southeastern Labrador. The completion of the TLH3 between Happy Valley-Goose Bay and Cartwright Junction in 2009 has provided increased access to and within the region, and will likely continue to influence local land and resource use patterns.

6.2.2 Strait of Belle Isle

The economy of the areas on both sides of the Strait of Belle Isle has traditionally been based on the fishery. The principal fisheries in recent years have been, by quantity: capelin, cod, shrimp, mackerel and herring, and by value: lobster, cod, seal harvesting, capelin, shrimp and scallop. Fishing in the Strait of Belle Isle generally takes place between May and November, and especially in June and July, primarily by small vessels fishing quite close to their home communities. Fishing seasons, areas and techniques do, however, vary considerably according to species.

There is a relatively high volume of general vessel traffic in the Strait, particularly between June and late November. There are vessel lanes with designated directions in the Strait, as well as a separation zone between the routing lanes.

The ferry route between St. Barbe, Newfoundland and Blanc-Sablon, Québec is located south of the Project. The marine vessel Apollo makes at least one, and frequently two or more, crossing(s) of the Strait of Belle Isle per day during the operating season, which typically extends from mid-April or early May to mid-January.

6.2.3 Island of Newfoundland

The Island of Newfoundland is, like Labrador, characterized by distinct and varied socio-cultural and economic landscapes. The profile of the existing socioeconomic setting focuses on the general regions of the Island crossed by the proposed transmission corridor, namely the Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula.

6.2.3.1 Historical Overview and Archaeology

Newfoundland and Labrador's cultural history is interesting and complex, and encompasses a period of up to 9,000 years. The first evidence of human occupation comes from sites in the Strait of Belle Isle area, followed by a succession of peoples and cultural traditions throughout various parts of the Island. The history of European exploration and eventual settlement extends over a period of about 1,000 years.

There are several thousand known archaeological sites on the Island of Newfoundland, which range in age from nearly 9,000 years BP to sites dating to the 20th century. Different parts of the Island of Newfoundland clearly have varying degrees of historic resources potential, with a great many of the known sites located along the coast and other concentrations in the north-central and eastern portions of the Island including along major watercourses.

6.2.3.2 Contemporary Socioeconomic Setting

The Island of Newfoundland comprises less than 30 percent (%) of Newfoundland and Labrador's total land area, but is home to nearly 95% of its population. The Island's residents live in approximately 250 municipalities as well as numerous smaller unincorporated communities, which range in size from less than five to over 100,000 persons, and are widely distributed along the Island's nearly 10,000 km of coastline and throughout its interior.

Northern Peninsula

The Northern Peninsula constitutes the largest distinctive geographical region on the Island of Newfoundland, and is home to approximately 18,000 residents in 70 communities. Its population has been steadily declining and aging in recent years, similar to the situation for much of rural Newfoundland and Labrador. The largest community in the region is St. Anthony, which provides key services to other communities throughout the region, as do other centres such as Port au Choix, Roddickton, Rocky Harbour among others. A highway extends from Deer Lake along the western coastline of the peninsula and north to the Straits, and across to communities on the north-east side.

The region has a long-standing linkage to the fishery. The collapse of the groundfish sector and subsequent closure of many of the fish processing plants had a social and economic impact on the region. However, recent years have seen transition, diversification and growth as a result of the harvesting and processing of alternative species such as shellfish. Tourism has also become a key component of the local economy, as a result of world class tourism attractions such as Gros Morne National Park, as well as the L'Anse aux Meadows and Port au Choix National Historic Sites and other attractions, activities and services. Other private sector enterprises and government services also employ a considerable proportion of the local labour force. There are a number of commercial outfitters in the region, with hunting and / or fishing camps along the northern and eastern sides and concentrated within the south-central part of the peninsula.

Central and Eastern Newfoundland

Central and Eastern Newfoundland is generally defined here as the area located to the south-east of the Northern Peninsula, through the north-central portion of the Island, and south-east to the Isthmus of Avalon. Approximately 72,000 people reside in this area, in numerous communities that stretch along the Trans-Canada Highway (TCH) and various roads that extend into interior and coastal areas. The overall population has been steadily aging and declining, similar to the situation in much of rural Newfoundland and Labrador. However, populations have remained relatively steady in recent years in several parts of the region.

The economy of Central Newfoundland has traditionally been based primarily on natural resource extraction and industrial development. Much of the population lives in the Grand Falls-Windsor and Bishop's Falls area, which is the industrial, service and government centre for Central Newfoundland, as well as in other regional centres such as Clarenville. Manufacturing, commercial, retail and government services employ a significant portion of the labour force, and tourism and recreational activities and associated facilities are also currently a key component of the region's economy.

Avalon Peninsula

The Avalon Peninsula comprises the south-eastern portion of Newfoundland, and is connected to the rest of the Island by a narrow isthmus. The peninsula is home to approximately 250,000 people, nearly half of the population of Newfoundland and Labrador as a whole, and has seen somewhat of a population increase in recent years.

The Avalon Peninsula region includes approximately 200 communities, ranging from larger urban areas such as St. John's (the provincial capital) and Mount Pearl, to towns such as Conception Bay South, Paradise and Bay Roberts, to numerous smaller rural communities throughout. The majority of the region's population live in communities with populations of more than 5,000 people.

The region has a well-developed and diverse economy, being the provincial centre for government and many services and industries. Given its large and concentrated population, portions of the Avalon Peninsula are also subject to fairly intensive land use, such as residential and cottage development, and industrial and agricultural areas.

6.3 Previous and Ongoing Human Activities and Developments

The proposed Project will cross areas of Newfoundland and Labrador that have seen various types, and varying degrees, of past and existing development activities.

These previous and ongoing human activities have influenced the existing environments in these areas, and are reflected in the description of the baseline environment (as described above, and in further detail in Chapters 10 and 15) also and in the component studies prepared for the Project's EA. Also, the current condition of the pre-Project environment as a result of these anthropogenic and / or natural factors - and thus, its likely sensitivity or resiliency to further disturbance or change - has been integrally considered in the environmental effects analyses presented in this EIS, including in assessing potential Project-specific and cumulative effects (Chapter 9).

The following subsections provide an overview of these previous and ongoing developments and other human activities in the general area of the Project, as further background on the environmental setting for the Project. In doing so, and for reference purposes, the overview generally describes the Project area on a segment by segment basis from Central Labrador to the Island's Avalon Peninsula, based on information gathered and presented elsewhere in the EIS, and / or through associated public and stakeholder consultation activities carried out during the EA.

6.3.1 Central and Southeastern Labrador

The Labrador segment of the proposed transmission corridor extends from the lower Churchill River in Central Labrador to the Strait of Belle Isle, for a distance of approximately 400 km, as described in the following sections.

6.3.1.1 Churchill River Valley to and along the TLH3 (approximately km 0 to km 150)

The Central Labrador region encompasses four communities; Happy Valley-Goose Bay, North West River, Sheshatshiu and Mud Lake, which have a total population of less than 10,000 people, and cover a combined land area of approximately 400 km^2. Development activities in the region are concentrated primarily within and near the communities and associated roadways and other infrastructure.

An Air Force base (5 Wing Goose Bay) has been operating since World War II, and military activities long formed the basis of the area's economy. From the mid-1980s to the late 1990s, a number of countries conducted low-level flying activities at Goose Bay, and various types of training activities continue today. The designated low-level flying training area is located over the interior of the Labrador-Québec Peninsula, and encompasses the western portion of the transmission corridor in Labrador.

The Churchill Falls Generating Station, one of the largest underground powerhouses in the world, has been in operation since 1971 and is located approximately 250 km west of the Muskrat Falls site. Water is stored in the Smallwood Reservoir, which covers an area of 6,988 km^2, and the generating plant at Churchill Falls has 11 turbines with a rated capacity of 5,428 megaWatts (MW). Earlier hydroelectric developments in Labrador include the station constructed at Menihek Lake in the 1950s (currently in operation) and at Twin Falls in the 1960s (maintained but not in operation).

The TLH which extends between Happy Valley-Goose Bay and Western Labrador was completed in the late 1990s, and has been undergoing additional upgrading work in recent years. The existing Nalcor Energy (Nalcor) 138 kilovolts (kV) Transmission Line (TL 240) extends between Churchill Falls and Happy Valley-Goose Bay.

There has been limited previous development activity in the immediate area of the proposed converter station and the initial segment of the transmission corridor, with the exception of the existing access roads and associated clearing and site investigation work at Gull Island and Muskrat Falls, as well as some local land and resource use activities.

The TLH3, an approximately 300 km long all-season gravel-surface road between Happy Valley-Goose Bay and Cartwright Junction, was completed in 2009 and is currently operational. From the south side of the Churchill River at Muskrat Falls, the transmission corridor extends inland for approximately 25 km, at which point it reaches and extends along the highway to approximately its southernmost point. A number of quarries and other cleared areas associated with highway construction are present throughout this area. Several fishing outfitter camps are located to the south-west of the transmission corridor on the Kenamu River / Minipi Lake systems, and to the north-east on the Eagle River system and plateau.

6.3.1.2 TLH3 to Pinware River (approximately km 150 to km 350)

This section of the proposed transmission corridor extends through a vast wilderness area which has seen limited previous human activities, with the exception of localized hunting, fishing and snowmobile use by residents.

6.3.1.3 Pinware River to the Strait of Belle Isle (approximately km 350 to km 400)

As the transmission corridor approaches the Labrador Straits it passes through popular cabin areas, including near Stag Pond and L'Anse au Loup Big Pond, and the general area supports hunting, fishing, wood cutting and snowmobile use by residents.

The Labrador Straits region itself includes eight communities with a total population of just less than 2,000 persons. These communities are connected by a paved highway that extends along the coastline. Development activities in the region are concentrated primarily within and near the communities and the road. The proposed transmission corridor extends to the Forteau Point area which is immediately to the south-west of that community.

6.3.2 Strait of Belle Isle

The economy of the areas on both sides of the Strait of Belle Isle has traditionally been based on the fishery, as described earlier. There is considerable fishing in the Strait of Belle Isle at present, particularly during the summer months.

In addition, there is a high volume of vessel traffic in the Strait of Belle Isle particularly between June and late November, including general vessel movements to and through the area, as well as the seasonal ferry services between St. Barbe and Blanc-Sablon.

6.3.3 Island of Newfoundland

The Island component of the proposed transmission corridor line extends from the Strait of Belle Isle to the Avalon Peninsula, for a distance of approximately 700 km, as described in the following sections.

6.3.3.1 Shoal Cove to Hawke's Bay (approximately km 0 to km 100)

Communities dot the coastline along the northern and western edges of the Northern Peninsula, which are connected by a paved highway (Route 430) with adjacent transmission line(s). The landing area for the proposed submarine cables is accessible by existing roads and is the site of localized development activities.

As the transmission corridor crosses the highway and heads inland and then south, it extends through an area of cabins and several outfitting camps, before crossing the existing highway across the peninsula (Route 432) and other resource roads and associated development areas.

South of this, the corridor passes through and adjacent to several existing resource road networks, with various harvesting and other land and resource use activities occurring throughout this area.

6.3.3.2 Hawke's Bay to the Main River (approximately km 100 to km 200)

In this area the proposed transmission corridor crosses over extensive networks of existing forestry access roads and trails. Much of this area has been subject to past forest harvesting and management activities, dating back to the early 1930s and continuing today. The area also has cabin developments throughout, particularly in proximity to these existing access roads, with other associated harvesting and recreational activities.

As the transmission corridor approaches and crosses the Long Range Mountains, the landscape and topography become considerably rougher, and there is less evidence of human development. This area is, however, the site of several commercial hunting and / or fishing camps, as well as other recreational activities such as snowmobiling and hiking.

6.3.3.3 Main River to Sheffield Lake (approximately km 200 to km 300)

Immediately south of the Main River Provincial Park and east of Gros Morne National Park, the transmission corridor again crosses existing forest access road networks and cutover areas, which increase in number and intensity towards the Silver Mountain and Upper Humber areas.

From there the corridor crosses over and follows along existing transmission lines and highways on the south-eastern portion of the Northern Peninsula and extends to the White Bay area (Routes 420 and 421), eventually crossing the TCH and existing transmission lines in the Birchy Lake area.

Near Birchy and Sheffield lakes, the corridor extends through an area of past forest harvesting and existing resource roads. This area has also seen considerable mineral exploration activity in recent years, and receives considerable use as a cabin, camping, hunting and general recreational area.

6.3.3.4 Sheffield Lake to Grand Falls - Windsor (approximately km 300 to km 400)

Past the Sheffield Lake area, the proposed transmission corridor extends inland in a south-easterly direction, before reaching an area of extensive existing access roads, previous forestry activity and cabin developments in the South Brook / Millertown Junction areas, crossing the Newfoundland T'Railway and then the Buchans Highway (Route 370) near Badger.

From there it travels through another area of existing resource roads and along the south side of the Exploits River, following existing transmission lines to the Grand Falls-Windsor area.

6.3.3.5 Grand Falls-Windsor to Clarenville (approximately km 400 to km 500)

The transmission corridor passes just south of Grand Falls-Windsor, crossing the existing transmission lines and highway to the Bay d'Espoir area (Route 360). From here it travels further inland and to the south-east, removed from the highway and communities in this region, but crossing or passing adjacent to extensive networks of existing access roads and trails and previous forestry activity.

At Port Blandford the transmission corridor reaches, and begins to follow adjacent to, existing transmission lines in this area, to the immediate south-west of the TCH and T'Railway.

6.3.3.6 Clarenville to the Isthmus of Avalon to Soldiers Pond (Approximately km 500 to 700)

The section of the transmission corridor from the Port Blandford / Clarenville area to its termination at Soldiers Pond follows adjacent to existing high voltage transmission lines.

As the transmission corridor approaches the Avalon Peninsula the diversity and intensity of development and other land uses increase considerably, with the corridor crossing or running adjacent to various highways and local roads, communities, trails, quarries, cottage areas, and other human activities.

6.4 Environmental Studies

To assist in ongoing design and planning for the Project and in preparation for its EA, Nalcor has undertaken a series of studies to obtain information on the existing biophysical and socioeconomic environments in the general area of the proposed Project and / or to assist in the eventual analysis of its potential environmental effects in the EA.

This has included environmental studies carried out by Nalcor from 2007 to 2011 related to a range of components, which have built upon previous work completed over the past several decades.

The following sections provide an overview of these environmental studies, which are used and cited extensively in the subsequent chapters of this EIS along with other relevant information sources. These have also been produced and submitted as Component Studies, as required under the EIS Guidelines and Scoping Document.

6.4.1 Terrestrial Environment

6.4.1.1 Vegetation

The following studies were assembled and submitted as the *Vegetation Component Study* for the Project's EA in May 2011.

Ecological Land Classification (Stantec 2010a): A regional Ecological Land Classification (ELC) identifying and delineating vegetation and habitat types along the transmission corridor and surrounding (15 km wide) area using air photos and satellite imagery with field validation. The study outputs include a detailed ELC study report outlining field and mapping methods, ecological descriptions of habitat types by area and associated mapping, as well as Geographic Information System (GIS) database produced at a scale of 1:75,000 covering the ELC study area. The ELC is a key and integral component of the EA, providing core information that has been used in several of the environmental studies described below, and which is used extensively in the EIS in assessing and quantifying the Project's potential interactions with vegetation and wildlife.

Wetlands Inventory and Classification (Stantec 2010b): The Wetlands Inventory and Classification study identifies and classifies all wetlands within the proposed 2 km wide transmission corridor, based on the ELC and associated imagery and fieldwork. High resolution satellite images, aerial photographs and data collected during field surveys were used in a GIS format to delineate and classify all of the approximately 1,700 wetlands within the proposed transmission corridor. The report provides a detailed wetlands atlas and GIS generated maps at the 1:50,000 scale, as well as a functional analysis overview of each identified wetland class.

Regionally Uncommon Plant Potential Mapping (Stantec 2010c): A modelling and mapping exercise was undertaken to identify the general location and extent of potential habitats for regionally uncommon plant species within the transmission corridor and the larger 15 km wide ELC study area. Information on the known distribution of such plants was acquired from the Atlantic Canada Conservation Data Centre (ACCDC) and other sources, and used to develop a habitat model to determine the potential for these plant species to occur in the various ELC Habitat Types and to identify any specific known locations. The report provides an atlas that indicates the areas predicted to have Low, Moderate, High and Very High potential for the occurrence of regionally uncommon plant species, for use in the EA and eventual transmission line right-of-way (ROW) route selection and any follow-up work.

Timber Resources (Stantec 2011a): The Timber Resources study uses forest inventory data and the ELC in a GIS format to describe and quantify the type and volume of forest resources expected to be harvested or otherwise affected as a result of the clearing of the transmission ROW and associated components.

Vegetation Supplementary Report (Stantec 2011b): A supplement that provides the above described information for the subsequently identified Labrador transmission corridor option from Muskrat Falls.

A supplementary report, *2011 Listed and Regionally Uncommon Plant Survey: Strait of Belle Isle Cable Landing Sites and Shore Electrodes Sites Supplementary Report* (Stantec 2011c) was also prepared. In July 2011, a detailed plant survey was conducted of both cable landing sites, and the electrode sites for listed and regionally uncommon (rare) plant species. The purpose of the surveys was to identify known locations of listed plants and regionally uncommon plant species in the transmission corridor and in the vicinity of Project components.

6.4.1.2 Wildlife

The following studies have been submitted as individual *Component Studies* for the Project's EA in 2011.

Caribou and Other Large Mammals Component Study comprised of the following reports:

- *Caribou and Their Predators* (Stantec 2011d);
- *Moose and Black Bear* (Stantec 2011e; Stantec 2010d);
- *Avifauna Component Study* (Stantec 2011f; Stantec 2010e); and
- *Furbearers and Small Mammals Component Study* (Stantec 2011g; Stantec 2010f).

These studies have identified, reviewed and presented information on these wildlife species and groups in and adjacent to the transmission corridor. In doing so, they have incorporated relevant wildlife and other field surveys undertaken by Nalcor and its predecessors, as well as the published and unpublished literature, information and datasets obtained from government agencies, and other sources.

The study reports present a region by region overview of the likely presence, distribution and status of wildlife species in and near the Project area, followed by more detailed information for a number of key and representative species, including any species of special conservation status.

The studies also use the ELC database to evaluate and map habitat suitability (primary, secondary and tertiary habitats) for select species within the transmission corridor and regional (15 km wide) ELC study area.

6.4.2 Freshwater Environment

Freshwater Environment: Fish and Fish Habitat, Water Resources Component Study (AMEC 2011a; AMEC 2010a): This study uses air photos, topographic mapping and high quality satellite imagery to identify and describe the watercourses and watersheds crossed by the transmission corridor. Each crossing was examined using a GIS system to characterize slope / flow morphology, substrate, wetted and channel widths and adjacent riparian vegetation. A field survey of representative crossing types was then conducted to support these results and to gather additional information on their key physical and biological characteristics, including stream morphology, fish species presence, and water and sediment quality. This information, and that obtained through an associated review of the literature and other available datasets, was used to describe water quality and quantity, fish habitat and known and likely fish species presence in the watercourses crossed by the transmission corridor.

6.4.3 Marine Environment

6.4.3.1 Fish and Fish Habitat and Water Resources

The following studies were assembled and submitted as the *Marine Environment: Fish and Fish Habitat, Water Resources Component Study* for the Project's EA in 2011.

Marine Fish and Fish Habitat in the Strait of Belle Isle: Information Review and Compilation (Sikumiut 2010a): This study involved the identification, compilation, review and presentation of existing and available information on marine fish and fish habitat in the Strait of Belle Isle. This includes information on the physical environment / marine habitats (climate, wind, bathymetry, water temperature and salinity, currents, tides, wave, icebergs and sea ice, and surficial geology) and the biological environment (plankton, benthic invertebrates, algae and fish species presence, abundance and distribution) in the area. The study report supplements Nalcor's marine surveys in the Strait of Belle Isle (as described below).

Marine Flora, Fauna and Habitat Survey – Strait of Belle Isle Submarine Cable Crossing Corridors, 2008 and 2009 (AMEC 2010b): A marine survey field program was conducted in 2008 and 2009 to gather detailed information on marine flora, fauna and habitat along the proposed submarine cable corridors in the Strait of Belle Isle. A 2008 vessel-based survey was conducted using a drop-video camera system, and resulted in seafloor video linear coverage over approximately 85% of the two identified corridor options. A 2009 dive survey in the shallow inshore area on the Newfoundland side covered an additional 2.8 km. The video collected was subsequently reviewed and analysed in detail to identify, classify and map the type, occurrence / abundance and distribution of marine habitat (substrate), macroflora and macrofauna within the submarine cable corridors. A shoreline and intertidal survey was also conducted at four potential cable landing sites on the Labrador and Newfoundland sides of the Strait.

Marine Habitats in the Strait of Belle Isle: Interpretation of 2007 Geophysical (Sonar) Survey Information for the Submarine Cable Crossing Corridors (Fugro Jacques GeoSurveys Inc. 2010): As part of its engineering and environmental programs in the Strait of Belle Isle, Nalcor has collected detailed information on bathymetry and substrate characteristics in the Strait of Belle Isle, including through side-scan sonar, multi-beam and sub-bottom profile surveys in 2007. This study presents a detailed analysis and interpretation of these geophysical survey data to identify and classify the seabed marine habitats (substrate types and water depths) within the cable corridors, also using the 2008 and 2009 marine video survey information (described above) to guide and inform the analysis. This study supplements the above discussed marine flora, fauna and habitat study by providing complete marine habitat analysis coverage for the then identified corridors.

Marine Water, Sediment, Benthos and Nearshore Habitat Surveys: Potential Electrode Sites (Sikumiut 2011a): A 2010 marine sampling survey to collect information on water and sediment quality, benthic invertebrates, bathymetry, substrate, macroflora and macrofauna distribution and backshore characteristics at two proposed shore electrode sites for the Project.

Strait of Belle Isle Submarine Cable Crossing Corridors: Marine Water, Sediment and Benthic Surveys (Sikumiut 2011b): A 2010 vessel-based marine sampling survey to collect information on existing water and sediment quality and benthic invertebrates along the submarine cable corridors.

Marine Flora, Fauna and Habitat Survey: Strait of Belle Isle Supplementary Report (AMEC 2011b): This report presents an ‘extraction’ of the relevant data from the 2005 to 2009 marine surveys that fall within the proposed single corridor and provides a summary overview of the information.

Marine Habitats in the Strait of Belle Isle: Interpretation of 2007 Geophysical (Sonar) Survey Information Supplementary Report (Fugro Jacques GeoSurveys Inc. 2011): This report presents an ‘extraction’ of the relevant data from the 2007 marine geophysical surveys and associated interpretation and analyses that fall within the proposed single corridor, and proposes a summary overview of the information.

Strait of Belle Isle Corridor Segment: Marine Water Sediment Benthos and Habitat Survey Supplementary Report (Sikumiut 2011c): This report presents the results of a marine habitat survey for the corridor segment to Shoal Cove. Marine water, sediment and benthic samples were also collected from within this same corridor segment and the results of these surveys are provided.

6.4.3.2 Marine Mammals, Sea Turtles and Seabirds

The following studies were assembled and submitted as the *Marine Environment: Marine Mammals, Sea Turtles and Seabirds Component Study* for the Project’s EA in 2011.

Marine Mammals, Sea Turtles and Seabirds in the Strait of Belle Isle: Supplementary Information Review and Compilation (Sikumiut 2010b): This report includes the identification, compilation, review, and presentation of existing and available information on marine mammals, sea turtles and seabirds in the Strait of Belle Isle area, as a supplementary update to the marine mammal and seabird studies described below.

Marine Mammals and Seabirds in the Strait of Belle Isle (Jacques Whitford 2000): Aerial and boat-based marine mammal and seabird surveys were conducted in the Strait of Belle Isle in the summer and fall of 1998, along with a detailed and comprehensive review of known sightings and other information from the available literature and other datasets. The study objective was to describe the occurrence, spatial and temporal distribution, and relative abundance of marine mammals and seabirds in the Strait and surrounding area during the ice-free season.

Strait of Belle Isle: Ambient Noise and Marine Mammal Survey (Jasco 2011a): A 2010 marine acoustic survey of ambient noise and marine mammal vocalizations at three locations within and near identified Strait of Belle Isle cable crossing corridors. The survey included the identification of marine mammal vocalizations to the species level.

6.4.3.3 Marine Environment and Effects Modelling

The following studies were assembled and submitted as the *Marine Environment and Effects Modelling Component Study* for the Project's EA in 2011.

Strait of Belle Isle: Oceanographic Environment and Sediment Modelling (AMEC 2011c): This study models and describes the existing oceanographic environment in the Strait of Belle isle, as well as the likely nature, extent and duration of suspended sediment concentrations that may result from construction activities associated with the installation of the proposed Strait of Belle Isle submarine cables. Using available oceanographic information and additional bathymetric, substrate and tidal data collected by Nalcor in 2007 to 2009, the study included the development of a two dimensional (2D) hydrodynamic model of the Strait of Belle Isle. This was followed by the use of a sediment dispersion model, utilizing the above information and Project engineering inputs, which modelled the likely zones of influence of sediment that may result from Construction activities in the Marine Environment.

Sound Modelling: Proposed Strait of Belle Isle Cable Installation Activities (Jasco 2011b): This study models and describes the noise that may be generated during the construction activities associated with the installation of the proposed submarine cables in the Strait of Belle Isle, for use in the marine effects analyses. The study included the installation of acoustic recording instruments in the Strait of Belle Isle in 2010 to gather information on ambient (baseline) noise levels. This and other oceanographic and Project information were then used to conduct a sound modelling exercise to predict and document the likely nature, intensity and propagation of sound that may be associated with various types and locations of cable crossing Construction activities in the Marine Environment.

Environmental Modelling: Proposed Shore Electrodes (Hatch Ltd. 2011): This study provides the results of a modelling exercise that was undertaken to provide information on the design characteristics, potential emissions, ground potential rise and electromagnetic fields that may be associated with the operation of the proposed shore electrode components of the Project, for use in the environmental effects analyses being completed for the Project's EIS.

6.4.4 Species at Risk

Species of Special Conservation Component Study (Nalcor 2011): A summary compilation of information on provincially and / or federally identified species of special conservation concern that are known or likely to occur near, and which may therefore interact with, the proposed Project. Such species are also considered integrally and in detail within the various individual environmental component studies described above.

6.4.5 Historic and Heritage Resources

Historic and Heritage Resources Component Study (Stantec 2011h; Stantec 2010g): This study includes background research, archaeological field surveys and mapping along the identified transmission corridors, utilizing and building on relevant work undertaken by Nalcor and / or its predecessors and others from 1998 to 2010. This report presents the results of the associated background research and fieldwork, and describes and maps previously known and newly recorded archaeological and ethnographic sites. This information then contributes to the mapping of archaeological potential along the transmission corridor, for which a detailed map atlas is presented in the report for use in the EA and eventual transmission line ROW route selection. The study also includes an analysis of the age and type of geological formations in the area to identify areas with the potential to contain paleontological resources.

A supplementary report, *2011 Historic and Heritage Resources Assessment and Potential Mapping: Strait of Belle Isle Cable Landing Areas and Shore Electrodes Sites Supplementary Report* (Stantec 2011i) was also prepared. This study included undertaking a detailed historic and heritage resource assessment at the proposed Strait of Belle Isle cable landing sites at Forteau Point (Labrador) and Shoal Cove (Newfoundland), and at the identified shore electrode locations at L'Anse au Diable (Labrador) and Dowden's Point (Newfoundland). Field assessment involved compiling data on previously recorded archaeological and contemporary sites, as well as visual reconnaissance and sub-surface testing and concluded with archaeological potential mapping.

6.4.6 Socioeconomic Environment

The following studies were assembled and submitted as the *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* for the Project's EA in May 2011.

Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation (AMEC 2011d; AMEC 2010c): This study analyzes and describes key aspects of the existing socioeconomic environment for use in the EA. This includes the general regions and communities which are crossed by or adjacent to the transmission corridor, as well as land and resource uses and other outdoor activities in these general areas, including commercial and recreational pursuits. It involved the compilation of information from the published and unpublished literature, existing and available datasets, as well as discussions and interviews with representatives of relevant governmental and non-governmental organizations, to describe and map the following key components: communities; transportation; hunting and trapping; angling and other fishing; hunting and fishing outfitters; motorized recreational vehicles; cabins and cottage development areas; other outdoor recreational activities; parks, reserves and other protected and special areas; forestry; mining and energy; agriculture and other uses and activities.

Analysis of Current Levels of Accessibility Along the Transmission Corridor (Integrated Informatics Inc. 2011): A study which analyzes and describes existing levels of human access to and within the transmission corridor, as additional socioeconomic baseline information and for use in the environmental effects assessment conducted for the EA.

The following studies were assembled and submitted as the *Socioeconomic Environment: Marine Fisheries in the Strait of Belle Isle Component Study* for the Project's EA in 2011.

Marine Fisheries in the Strait of Belle Isle (Canning & Pitt Associates Inc. (C & P) 2010a): A study of marine fishing activity in the area of the Project's submarine cable crossing of the Strait of Belle Isle, based on the compilation and analysis of existing and available datasets, the literature and interviews. The report describes relevant fisheries activities (1989 to 2008) for the wider Strait of Belle Isle area (Northwest Atlantic Fisheries Organization (NAFO) Unit Area 4Ra) and then focuses on current local fisheries near the potential submarine cable crossing corridor. In addition to existing fisheries statistical data from Fisheries and Oceans Canada (DFO), the report also includes the results of consultations with fishers from communities on both sides of the Strait, as well as discussions with relevant governmental and industry representatives.

An attached *Supplementary Report* (C & P 2010b) provides additional information on fishing equipment and activities, with a focus on the Strait of Belle Isle scallop fishery.

A further *Supplementary Report* (Jacques Whitford 2001) presents the results of a previous review of fisheries in the Strait of Belle Isle, as additional background information.

Socioeconomic Environment: Aboriginal Communities and Land Use Component Study (Nalcor et al. 2011): This study provides information on relevant Labrador and Québec Aboriginal communities and their contemporary land use activities in Central and Southeastern Labrador for use in the EA. The study focuses on land use by Aboriginal groups who reside in or claim Aboriginal rights or title along or adjacent to the proposed transmission corridors in Central and Southeastern Labrador. The groups included in the study are Labrador Innu (Sheshatshiu and Natuashish, as represented by Innu Nation), Labrador Inuit (Nunatsiavut Government), NunatuKavut Community Council (formerly Labrador Metis Nation) and Innu and Naskapi of Québec including: Pakua Shipi, Unamen Shipu, Nutashkuan, Ekuanitshit, Uashat mak Mani-Utenam, Matimekush-Lac John and Kawawachikamach. In addition to a description of their contemporary land use, a socioeconomic summary is provided for each Labrador and Québec Aboriginal community or organization. The information upon which the study is based was derived from published and unpublished literature, information provided to Nalcor by Aboriginal groups and from the results of recent consultation activities and socioeconomic data collection initiatives completed for the EA by Aboriginal groups in cooperation with Nalcor.

Viewscapes (Stantec 2011j): The study makes use of Project engineering inputs and spatial imagery, digital elevation data and the vegetation analysis completed for the ELC (as described above) to evaluate whether, and to what degree, the proposed Project infrastructure will be visible from adjacent areas. In addition, particular locations were the subject of detailed visual modelling. Visual modelling used 3D virtual rendering software to develop pre- and post-construction conceptual illustrations (or photosimulations) depicting the view of the proposed transmission line towers from a number of representative habitat types / key sites along the corridor, identified through EA consultations. The results of the viewshed analysis along and adjacent to the proposed transmission corridor are also presented.

6.5 Information Availability and Gaps

As a result of the environmental studies, analyses and consultation activities conducted by Nalcor in relation to this EA, there exists a considerable body of knowledge about the Project, the natural and human environments through which it will extend, and its potential interactions with the environment, for use in the EIS.

6.5.1 Existing Environment

As outlined in the preceding section, extensive environmental study programs have been undertaken in relation to the Project and its EA over several years. The objective has been to gather and present useful and relevant information on key aspects of the existing biophysical and socioeconomic environments, and in doing so, to provide an appropriate and meaningful understanding of existing conditions in and near the transmission corridor for use in the EA.

In planning and conducting these studies, the nature and geographic scale of the Project has been an important consideration. Rather than base the environmental baseline description solely on a “snapshot survey” understanding of the existing environment along the 1,100 km long transmission corridor at one or limited points in time, a range of data collection methods and information sources were used. This included a combination of environmental field surveys, the compilation and analysis of existing and available information and datasets, and associated mapping and analysis. The nature and outcomes of these environmental studies are described above and throughout this EIS, with these studies also being submitted as individual Component Studies for review under the EA process.

The information on, and understanding of, the existing biophysical and socioeconomic environments obtained through these studies and other sources (as reported herein and elsewhere) are considered adequate and appropriate for conducting the Project’s EA.

6.5.2 Environmental Issues and Effects

Through its consultation initiatives with relevant government departments and agencies, Aboriginal and stakeholder groups and the general public (as described in Chapters 7 and 8) Nalcor has a good understanding of questions and concerns that may be associated with the Project and its potential environmental effects. The environmental effects analyses reported in this EIS (Chapters 11 to 14 and 16) focus on the environmental issues raised through these previous and ongoing consultation activities.

In addition, the potential environmental effects of constructing and operating transmission lines and associated infrastructure are considered to be generally well understood. Nalcor and its subsidiaries have well over four decades of experience in planning, designing, assessing, building and operating transmission infrastructure projects, and currently maintain an extensive electricity transmission and distribution system throughout Newfoundland and Labrador. This direct experience, as well as other sources of information and "existing knowledge" regarding the outcomes and experiences of similar types of projects have also guided and been incorporated into this environmental effects analysis.

6.5.3 Information "Gaps"

Identification of information gaps has been a continual process throughout the Project's planning and EA. Information 'gaps' were identified: (i) through consultation with government agencies, Aboriginal groups and the public; (ii) the result of ongoing engineering and modifications to Project design; and, (iii) the design and information collection for the component studies to describe the existing environment. Where such 'gaps' were identified, Nalcor conducted additional baseline studies to gather and compile information to fill these 'gaps'. For example, the original Project concept for the Strait of Belle Isle submarine cable crossing saw the preliminary identification of potential cable landing sites at Forteau Point and Mistaken Cove. Since that time, through Nalcor's Project planning and engineering, Shoal Cove has been identified as the proposed cable landing site on the Newfoundland side of the Strait of Belle Isle. To address this information 'gap', Nalcor conducted detailed historic and heritage resource surveys and listed and regionally uncommon plant surveys at these sites to identify issues and develop appropriate mitigation options to avoid adverse effects.

Throughout the EIS, any uncertainties in the assessment have been addressed by using conservative estimates and assumptions as per Nalcor's precautionary approach in order to make reliable predictions about likely residual project effects. Discussion of how uncertainty has been addressed in the EIS is provided throughout the assessment where appropriate. Uncertainty will also be further addressed through the monitoring or follow-up programs, and adaptive management.

6.6 Likely Future Environmental Conditions without the Project

Environmental systems are not static in nature, but rather are constantly changing over time, both naturally (e.g., forest fires) and as a result of human activities and influences (e.g., forestry, access). Consideration of the existing, pre-project "baseline" environment must therefore recognize that aspects of the biophysical and socioeconomic environments are dynamic and will continue to change in the future, even without the Project.

This "without the project" future environment should therefore also be considered in an EA in assessing and evaluating the potential future effects of a project. This is reflected in, for example, the definitions provided in the Newfoundland and Labrador *Environmental Protection Act* where environmental effect means "a change in the present *or future environment* that would result from an undertaking" (emphasis added).

Recognizing that it is somewhat speculative and certainly challenging to predict the likely future characteristics of the environment across Newfoundland and Labrador in the long-term and with precision, the following discussion provides a general overview of the manner in which the existing biophysical and socioeconomic environments may change in the future without the Project.

Potential environmental effects that are likely to result from other future projects and activities in conjunction witht he Project are also assessed as part of the cumulative effects analysis presented for each Valued Environmental Component (described in Chapter 9).

The Project is assumed to operate in perpetuity, so this discussion addresses, to the extent feasible, the first 100 years. In the absence of the Project over this time period, natural physical environmental and ecological processes will likely continue, as will any climate changes that are occurring. Physical developments and activities within the province will also likely continue to occur as part of the social and economic environments. These continuing processes and developments will lead to environmental change and effects on environmental resources.

6.6.1 Atmospheric Environment

The effects of climate change in Newfoundland and Labrador are discussed in detail in section 4.1.11. Over the next century, changes in temperature, precipitation patterns and extreme events are predicted for Newfoundland and Labrador (Natural Resources Canada (NRCan) 2010, internet site). These changes in climate are expected to be more pronounced inland than at the coastal areas due to the moderating effects of the Labrador Sea.

In summary, without the Project it is predicted that over the next 80 to 100 years, temperatures will continue to rise slightly, precipitation will continue to increase, and sea levels will continue to rise. The warmer temperatures during fall and winter are predicted to result in later freeze-up, heavier snow, more rain occurring later into the fall, and possibly more freezing precipitation during the fall and winter. With little change in spring temperatures, differences in ice break-up patterns are expected to be slight over the next century (Lines et al. 2005).

Currently, Newfoundland and Labrador makes a small contribution to the total national GHG emissions with limited variation across the Project regions. The province experiences relatively low emissions of air contaminants with the ambient air quality representative of a rural and clean environment and few industrial facilities located in the Project regions. In the absence of the Project, the province is expected to experience small changes in background air quality and atmospheric deposition from the long-range transport of air contaminant emissions. However, even with planned developments such as highway infrastructure improvements in southern Labrador, continued forest harvesting, potential industrial developments and other economic activities, and the growth of the provincial population, the atmospheric environment will likely experience limited change based on the natural state of much of Newfoundland and, particularly, Labrador.

Ambient sound in Newfoundland and Labrador is dominated by the sounds of nature with minimal contributing sound sources located in the Project regions. Without the Project the ambient sounds are expected to be of the same types and levels, with human generated noises primarily associated with aircraft, vehicle, and vessel traffic.

6.6.2 Terrestrial Environment

Vegetation in the regions crossed by the Project transitions from the more northern Arctic ecosystem of the Taiga Shield Ecozone in central and southeastern Labrador typically associated with upland areas and higher elevations to, primarily, the Boreal Shield Ecozone of southern Labrador and the Island of Newfoundland typically associated with upland coniferous forest interspersed with drainages and wetlands. Without the Project, the disturbance to vegetation (e.g., clearing of the Project components) would not occur, thus allowing the vegetation in those areas to continue to be influenced primarily by such factors as forest fire, insect infestations, disease and commercial forest harvesting, with the result that mature forest will be replaced by younger seral stages over time.

The rate of changes to the existing vegetation mosaic would be expected to be influenced by the demand for natural resource based products (e.g., several mills have closed), and this trend could continue. Considering this, and the slow growth of vegetation in cooler climates (even considering slight warming trends), the changes are expected to be gradual, and primarily reflect natural succession and natural events (e.g., forest fires). As the landscape has been formed by these natural processes, this would be expected to continue without the Project, with the same general landscape patterns that currently exist, present over the next 100 years.

Increased human activities (e.g., off highway vehicle use, consumptive and non-consumptive recreational activities), and changes in vegetation cover and access due to commercial forestry and other industrial activities would be expected to continue to increasingly affect the distribution and / or abundance of wildlife species, including boreal woodland caribou in Newfoundland, as well as furbearers and avifauna. However, this is expected to be addressed through management actions (e.g., forestry plans) and herd management.

Listed species are expected to be present, with populations benefitting from management actions, including recovery strategies. The fate of the Red Wine Mountain caribou herd may be addressed through deliberate management actions, but if the main stressors continue unchecked, their fate is expected to remain tentative.

The natural succession and changes to habitat resulting from fires will continue to influence the available habitat's ability to support wildlife species (e.g., woodland caribou will avoid burns). It would be expected that pressures on sensitive species, such as the woodland caribou, would continue to occur due to changes in habitat, either from natural or anthropogenic sources, but that regulators responsible for managing these species will respond appropriately to ensure their sustainability.

6.6.3 Aquatic Environment

The freshwater environment is expected to change little over the next 100 years, with potentially slightly higher amounts of runoff resulting from increased precipitation and snow melt. However, the changes would be such that ecosystems are expected to function as they currently do, and support the same types and distributions of fish and fish habitat. This is supported by the highly regulated nature of this resource and ongoing management related to permitting and protection (e.g., permits required for fording, angling regulations).

6.6.4 Marine Environment

The Strait of Belle Isle and Conception Bay will continue to be affected by marine vessel traffic and related spills, air pollutant deposition, and increased sea levels due to climate change. In low-lying and low-sloping coastal areas, sea level changes may have a greater effect (e.g., increased rates of erosion, coastal landslides, loss of beaches). Without the Project, this current, ongoing change is expected to continue.

Without the Project, the protective rock berm to be constructed over each of the submarine cables would not be in place, and would not generate the habitat change that this diverse substrate would facilitate. However, with or without the Project, the Strait of Belle Isle is expected to remain a dynamic, harsh, and relatively pristine marine environment.

6.6.5 Socioeconomic Environment

The socioeconomic environment of the province is expected to continue to be driven by the natural resources sectors (e.g., fisheries, water, nickel and iron ore mining, forestry, offshore oil) and the related support services, as driven by market demand (e.g., less interest in forestry, more interest in offshore oil).

The natural beauty of the province will likely continue to attract increased numbers of people, as they search for vacation destinations, resulting in more tourism and recreation traffic to the province. It is not possible to predict what the level of growth will be in these industries, but the growth will likely be limited by capacity and seasonality, the economic situation and the demand for these resources. Increased transportation systems (e.g., the Trans-Labrador Highway) and the province's promotion of tourism would be expected to increase opportunities for growth.

The province is expected to continue its economic growth into the future, considering the economic benefits of offshore oil, mining in western and northern Labrador, and the Vale nickel processing facility. In addition to these larger projects, economic prospects for the short- to medium-term suggest that many regions could see significant new economic activity, from such activities as the Lower Churchill Hydroelectric Generation Project, mining activity in the Baie Verte area, and construction of mineral processing and offshore petroleum production facilities at Bull Arm. Without the Project this growth is expected to be somewhat slower, recognizing the unrealized Construction, and Operations and Maintenance opportunities that would be created in some of the rural regions of the province.

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 7

Aboriginal Consultation and Issues Scoping

April 2012

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LIST OF ACRONYMS

Acronym	**Description**
EA	Environmental Assessment
MOU	Memorandum of Understanding
IBA	Impacts and Benefits Agreement
ITK	Innu Traditional Knowledge
ITKC	Innu Traditional Knowledge Committee
ROW	right-of-way
LMN	Labrador Metis Nation
NCC	NunatuKavut Community Council
Project	Labrador-Island Transmission Link
ftp	file transfer protocol
EIS	Environmental Impact Statement
LILCA	*Labrador Inuit Land Claims Agreement*
TLH	Trans-Labrador Highway
EMF	electromagnetic field
NL	Newfoundland and Labrador (Province)
QC	Québec (Province)

7 ABORIGINAL CONSULTATION AND ISSUES SCOPING

Nalcor Energy (Nalcor) is committed to consulting Aboriginal communities and organizations appropriately on the proposed Labrador-Island Transmission Link (Project). Section 2 of the EIS Guidelines and Scoping Document recommends the proponent provide up-to-date information, as it becomes available, to Aboriginal groups and especially to communities likely to be affected by the Project; involve the main interested parties in determining how best to deliver the information, the type of information that is required, format and presentation methods and the need for community meetings; provide explanations of the results of the EIS in a clear and direct manner to make the issues comprehensible to a wide audience; and for the Proponent to consider and acknowledge all requests for consultation with Aboriginal groups during project approvals and the life of the project.

Based on these guiding principles, the following provides an overview of relevant Aboriginal communities and organizations, as well as Nalcor's previous and ongoing consultation processes and activities with both Labrador and Québec groups, and the outcomes of these initiatives.

7.1 Overview of Aboriginal Consultation Activities and Initiatives

Nalcor has planned, offered and undertaken various consultation processes and activities with Aboriginal groups with the purpose of providing and receiving information on the Project and its potential environmental effects, and collecting Aboriginal Ecological Knowledge on the existing environment for incorporation into the Environmental Impact Statement (EIS). The key objectives and elements of Nalcor's Aboriginal consultation program include:

- providing Aboriginal communities with information on the proposed Project, including its purpose and associated components and activities;
- identifying and documenting any questions or concerns about the Project and its potential environmental and socioeconomic effects and benefits;
- collecting and sharing information on contemporary land use activities by Aboriginal persons in or near the Project area, as well as relevant Aboriginal knowledge; and
- discussing possible approaches and measures to avoid or reduce any likely adverse effects and enhance benefits of the Project on Aboriginal communities and their interests and activities, and on the environment in general.

Consultation with Aboriginal communities and organizations for the Project has been ongoing for several years, including prior to the registration of the Project under the provincial and federal environmental assessment (EA) processes. In January 2009, Nalcor contacted all relevant Labrador and Quebéc Aboriginal communities and organizations within several days of the Project's registration to provide the document and further details on the EA process and, in February 2009 provided a French translation to all French speaking Aboriginal communities in Québec. Further details on Nalcor's correspondence, discussions and other consultation initiatives and offers with individual groups are provided throughout this Chapter.

Nalcor's approach to planning, undertaking and supporting consultation is both group- and Project-specific, given the nature and location of the proposed development and the type and level of interest by a particular Aboriginal community. It is Nalcor's practice, when required or requested, to provide translation of oral presentation in the Aboriginal language spoken by the Aboriginal group. Nalcor recognizes and acknowledges that Aboriginal communities and organizations often require additional resources and support when engaging in consultation processes, particularly with regard to large development projects and their EAs. While there is no legal requirement for formal capacity arrangements, Nalcor has developed an approach to consultation which includes the provision of funding and / or other support to Aboriginal communities and organizations to facilitate Project-related consultation, where appropriate. Consultations and negotiations with the Labrador Innu were carried out between the Proponent and Innu Nation, between 2000 and 2011 pursuant to a series of Process Agreements and a subsequent Memorandum of Understanding (MOU) signed between Nalcor and Innu Nation in 2009, as well as various subsequent mechanisms. These are discussed in detail in the section that follows.

Commencing in the spring of 2009, Nalcor proposed to enter into community engagement agreements with the following Labrador and Québec Aboriginal communities and organizations, as a basis for further discussion and cooperation related to its proposed development activities in Central and Southeastern Labrador:

- NunatuKavut Community Council (NCC) (formerly the Labrador Metis Nation);
- Pakua Shipi (St. Augustin);
- Unamen Shipu (La Romaine);
- Nutashkuan (Natashquan);
- Ekuanitshit (Mingan);
- Uashat mak Mani-Utenam (Sept-Îles); and
- Matimekush-Lac John (Schefferville).

In 2010, several of these Aboriginal groups were also offered further consultation arrangements specific to the proposed Project and its EA. The nature and outcomes of these discussions are described for each group in the sections that follow.

Although the proposed Project does not cross through or near land areas covered by the *Labrador Inuit Land Claims Agreement* (LILCA), Nalcor remains committed to open discussions with the Nunatsiavut Government and has and will continue to provide information on the Project and its EA to the Labrador Inuit.

Nalcor has also initiated, and continues to seek opportunities to engage in appropriate consultation with the Naskapi Nation of Kawawachikamach, Québec.

On November 24, 2010, further correspondence providing additional information on the proposed Project was sent to each of the above groups, proposing that Nalcor provide a Project presentation in their communities in the near future. In April 2011, another letter was sent to inform these groups of upcoming open houses.

7.2 Labrador Innu

The Innu, formerly known as the Naskapi-Montagnais Indians, are indigenous inhabitants of an area they refer to as Nitassinan, which comprises the eastern portion of the Québec-Labrador peninsula. They were traditionally a nomadic people, whose movements responded to the seasons and the migration of the animals they relied upon. This traditional way of life continued until the mid-twentieth century, when many Innu were settled into communities. The Labrador Innu continue to attach great importance to time spent in Nutshimit (the country), which for many is seen as an opportunity for cultural and physical renewal.

The approximately 2,200 Labrador Innu reside primarily in two communities - Sheshatshiu in Central Labrador and Natuashish on the north-east coast. The Mushuau Innu resettled from Davis Inlet to Natuashish in 2002-2003. Small numbers of Innu also reside in Happy Valley-Goose Bay and elsewhere.

The Sheshatshiu Innu and the Mushuau Innu of Natuashish are separate Labrador Innu Bands and each community is a Reserve with an elected Chief and Council. Both communities are represented by Innu Nation in land claims negotiations and on other matters of common interest.

The Innu of Labrador claim Aboriginal rights and title to much of Labrador. The Labrador Innu land claim area overlaps the proposed Project area, and is the only such claim in the region that has been accepted for negotiation by both the Government of Canada and the Government of Newfoundland and Labrador.

7.2.1 Consultation and Participation

Nalcor's consultation with Labrador Innu has occurred over approximately the past 12 years, and has included consideration of both the proposed Project and the Lower Churchill Hydroelectric Generation Project. Consultation activities for the purpose of issues scoping and the collection of Aboriginal Ecological Knowledge have occurred through the use of various methods such as studies, funding mechanisms and direct consultation with the communities. Sources of Aboriginal Ecological Knowledge include, but are not limited to, land use surveys and interviews, reviews of existing published and unpublished literature and through the provision of information to Nalcor by Labrador Innu. This longstanding relationship was first established in 1999, and included *Process Agreements* negotiated between Newfoundland and Labrador Hydro (Nalcor's predecessor) and Innu Nation. These agreements established and funded mechanisms for ongoing consultation and negotiations related to these projects, with subsequent agreements and extensions occurring throughout the 1999-2003 period.

Consultation and negotiation with the Labrador Innu were resumed in late 2005 under subsequent *Process Agreements*, and focused on three key elements and activities:

1) Impacts and Benefits Agreement (IBA) negotiations;
2) Innu Community Consultation; and
3) Environmental and Engineering Issues and Studies.

While the final Process Agreement expired in late 2008, a number of additional agreements and processes have been established since that time in order to undertake ongoing Labrador Innu consultation and negotiations on, and participation in, the projects. These are also described below.

7.2.1.1 Impacts and Benefits Agreement

Nalcor and Innu Nation have negotiated and concluded an IBA pertaining to both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project. The IBA, which was ratified by the membership of Innu Nation on June 30, 2011 and signed on November 18, 2011, defines how the Labrador Innu will participate in and benefit from these development projects.

The IBA is the outcome of several periods and processes of discussion and negotiation over 10 years between Innu Nation and Nalcor and its predecessors. On September 26, 2008, Innu Nation and the Government of Newfoundland and Labrador announced the signing of the *Tshash Petapen Agreement* (which translates as the "New Dawn Agreement"), which resolved key issues relating to matters between the province and Innu Nation surrounding the Innu Rights Agreement, the Lower Churchill IBA and Innu redress for the Upper Churchill Hydroelectric Development. On February 16, 2010, Innu Nation leaders, the Government of Newfoundland and Labrador, and Nalcor, initialled an agreement that completed the outstanding issues associated with the New Dawn Agreement. Consultation had been ongoing with Innu Nation since the initialling of the agreement, which described the obligations of Nalcor and Innu Nation, until ratification and implementation of the IBA.

The specific nature and provisions of the IBA are and will remain confidential. The IBA does, however, include processes for continued consultation and cooperation throughout the planning, Construction and Operations and Maintenance phases of the projects. The IBA also includes mechanisms intended to help avoid or reduce potential adverse effects on Innu and Innu communities, and for creating and enhancing potential benefits, including compensation. This also includes processes and provisions related to Innu employment, training, business opportunities, workplace policies and conditions, environmental management, revenue sharing and other issues.

7.2.1.2 Innu Community Consultation

Under the previously described Process Agreements, Nalcor and Innu Nation also developed and implemented processes for Innu-led consultations in the communities of Sheshatshiu and Natuashish. These Innu community consultation processes were originally established in 1999 and re-initiated in 2005 and continued to late 2008. With a view to ensuring that such consultation was as effective and meaningful as possible, this consultation was led by Innu Nation at its request, with funding provided by the proponent. An Innu Community Consultation team comprised of an Innu Consultation Coordinator and Consultation Commissioners in each of the two Labrador Innu communities provided information and conducted ongoing consultation related to the projects. A range of approaches and techniques were used, including community meetings, newsletters, radio programs, drop-in centres, site visits and other mechanisms.

As part of that process, Nalcor participated in community meetings in Sheshatshiu and Natuashish, as requested by Innu Nation, to provide information and updates, answer questions and identify issues or concerns. Nalcor also provided Project and other information to the Innu community consultation team on an ongoing basis, as well as through workshops, site visits and other forums.

The Innu community consultation process provided a means to both inform the Innu communities and provide a forum in which they could raise concerns about the nature and status of the projects, including the associated environmental and engineering work, and potential environmental and socioeconomic effects. It also served as a forum for Innu Nation to consult with its membership during the IBA negotiations.

The Innu community consultation team provided reports to both Innu Nation and Nalcor on the activities and findings of the consultation process. These and previous reports from past Innu community consultation processes have provided information essential to both Project planning and issues scoping for the EA.

In addition to the above-listed consultation activities, an open house was held by Nalcor Energy in Sheshatshiu on June 2, 2011. Information on public notifications, open house format, and display materials are presented below, as well as issues and concerns related to the Project that were identified during the open house.

Prior to the open house session, public notification activities included newspaper advertisements, public notices, and invitations. This included advertisements in The Labradorian and The Northern Pen newspapers on May 23 and 30, 2011, as well as radio advertisements, direct distribution of public notices and posting on the Nalcor website, and a press release issued by Nalcor. A letter regarding the open house was also sent by Nalcor to Innu Nation on April 19, 2011.

The Sheshatshiu open house was held at the Sheshatshiu Innu School on June 2, 2011, from 4 to 8 pm. Upon arrival, participants were welcomed by a Project team member who provided an overview of the open house session. There were a total of six information stations, a sign-in table, feedback table, and refreshment table. At least one Nalcor representative was present at each station to answer questions and gather feedback from participants. Before leaving, participants were encouraged to fill out a feedback form.

The six information stations were as follows:

- Station one provided a corporate overview of Nalcor and included information about its five lines of business, vision, values and goals. Take-away material included a corporate brochure.
- Station two provided information about the proposed Project and the Lower Churchill Hydroelectric Generation Project. Take-away material included maps and fact sheets on the projects, and employment and business opportunities.
- Station three provided information about the EA processes and the individual EA reviews for the two projects. Take away material included information sheets on the EA and environmental studies.
- Station four provided information about potential employment and business opportunities.

- Station five provided fact sheets on the Holyrood Thermal Generating Station, electricity rates and demand, and a Nalcor video.
- Station six included models of the projects and their associated components.

Nine people attended the Sheshatshiu open house. Questions and issues raised include the following:

- the need for early training to ensure Innu have access to skilled labour positions and job mobility after construction;
- Nalcor needs to ensure that Innu are aware of employment opportunities so they can take advantage of benefits;
- elders are concerned about destruction of plants and wildlife and that the IBA may only benefit certain people;
- concern that the Project will draw labour from local businesses that cannot compete with Project wages; and
- concern that money made from working on the Project may increase drug and alcohol consumption.

7.2.1.3 Environmental and Engineering Issues and Studies

Under the Process Agreements, a Task Force comprised of representatives from Nalcor and Innu Nation was put into place to facilitate Innu involvement in the planning, conduct and review of environmental and engineering work for the projects.

This technical committee included the participation of Nalcor's environmental and engineering personnel, as well as a technical advisor and Innu community representatives hired by Innu Nation. Resources were also provided for Innu Nation to engage additional technical and expert advice on these matters, as required. A key role of the Innu community representative on the Task Force was to consult with the Innu communities on the environmental and engineering studies and environmental assessment (EA), and to bring this information forward to the Task Force.

Through the Task Force, Nalcor provided regular project updates and briefings, and consulted with Innu Nation in the design, implementation and review of the associated environmental baseline studies and the engineering programs. The Task Force met regularly from 2005-2008 and exchanged significant amounts of project information on a continuous basis through teleconferences, email, a file transfer protocol (ftp) site and other mechanisms. Through these mechanisms, Innu Nation was able to receive and review the following: technical specifications for planned and ongoing environmental and engineering studies; regular updates on the status of this work while it was in progress; as well as draft and final reports associated with these studies.

Aboriginal traditional and community knowledge is recognized as assisting in understanding matters such as: ecosystem functions; resource abundance, distribution and quality; social and economic well-being; and, use of the land resources. The Task Force also provided a forum for Nalcor and Innu Nation to discuss Innu Traditional Knowledge (ITK). The eventual result of these discussions was the development and implementation of an Innu-led process to document and share ITK for the EAs, based on an approach and methodology proposed by Innu Nation. An Innu Traditional Knowledge Committee (ITKC) was established under 2006 and 2007 Process Agreements, as an adjunct to the Task Force. The role and purpose of the ITKC was to discuss, document and share ITK for consideration in the projects' EAs. The ITKC was comprised of Innu Elders and a Researcher / Facilitator, and was in place until April 2007. The ITK documented through this process was provided by Innu Nation to the Task Force for discussion, and as relevant and appropriate, incorporated into the EAs, according to an ITK Protocol developed by Nalcor and Innu Nation.

Nalcor subsequently offered to re-establish the ITKC under a Process Agreement in 2008 in order to undertake a similar ITK gathering exercise for the Project and its EA. Innu Nation subsequently responded that the original ITK Report (discussed above) was equally applicable to the Project and, thus, any reestablishment of the ITKC would be unnecessary. The ITK gathered and documented through the ITKC process that is relevant to this Project and its EA has been incorporated throughout the EIS.

Innu Nation, as copyright owner of the Innu Environmental Knowledge of the Mishta-shipu (Churchill River) Area of Labrador in Relation to the Proposed Lower Churchill Project (ITKC Report) has granted Nalcor a non-exclusive royalty-free licence to use the ITKC Report or extracts there from in this EIS, on condition that the full report is contained as an Appendix to the EIS. The ITKC Report is included as Appendix 10-1 in the EIS. Nalcor acknowledges that Innu Nation's giving of this licence shall not be interpreted as concurrence with Nalcor's interpretation of the information in the ITKC Report as contained in the EIS. This licence was granted at the request of Nalcor.

In 2009, Nalcor and Innu Nation also worked together under an MOU, which provided for Innu Nation's continued involvement in the early planning and review of the Project's environmental and technical studies.

7.2.2 Summary of Project-Related Consultation Activities with the Labrador Innu

A summary of the various Innu consultation initiatives related to this Project is provided in Table 7.2.2-1. The table also highlights key questions and issues identified through these activities, and where these are addressed in this EIS.

Table 7.2.2-1 Consultations with Innu Nation and Key Outcomes

Date	Location	Number of Participants[a]	Purpose and Focus[b]
July 13, 2006	St. John's, Newfoundland and Labrador (NL)	2	Discussion of planned historic resources study for the Project and EA
August 28 to 30, 2006	Happy Valley-Goose Bay, NL	5	Discussion of historic resource study for the transmission line corridor for Labrador
January 16, 2007	Natuashish, NL	36	Community consultation, included discussion about the Project
May 25, 2007	Teleconference	2	Discussion of transmission line corridor selection and electrodes
May 30 and 31, 2007	Happy Valley-Goose Bay, NL	1	Discussion of engineering and environmental studies related to transmission, specifically corridor selection and alternatives
June 15, 2007	Teleconference	1	Discussion of corridor selection for the transmission line, and other engineering and environmental studies for the Project
July 16, 2007	Happy Valley-Goose Bay, NL	3	Discussion of electrode engineering studies
August 28 and 29, 2007	St. John's, NL	2	Discussion of engineering and environmental study reports
October 18 and 19, 2007	St. John's, NL and teleconference	2	Discussion of transmission corridor selection and the planning of environmental and engineering studies
November 21, 2007	St. John's, NL	2	Discussion of the Labrador electrode and transmission line study areas

Table 7.2.2-1 Consultations with Innu Nation and Key Outcomes (continued)

Date	Location	Number of Participants[(a)]	Purpose and Focus[(b)]
December 19, 2007	St. John's, NL	3	Discussion of transmission line constraints mapping and eventual route selection
January 22, 2008	Teleconference	2	Discussion of transmission line route selection and infrastructure, and ongoing engineering reports
February 13 and 14, 2008	Sheshatshiu, NL and Happy Valley-Goose Bay, NL	5	Discussion of Innu Nation land use within the transmission line study areas
April 23 and 24, 2008	Sheshatshiu, NL and Happy Valley-Goose Bay, NL	5	Discussion of intent to register the Project for EA, the 2008 environmental and engineering studies, and infrastructure for the transmission line
July 8, 2008	Teleconference	4	Presentation of an update on the Project, the environmental baseline studies and EA
February 11, 2009	Sheshatshiu, NL	5	Presentation and discussion of the Project and the environmental baseline studies and EA
July 22, 2009	St. John's, NL and teleconference	3	Presentation and update on the Project and the environmental baseline studies and EA
December 9, 2009	Sheshatshiu, NL	29	Presentation and discussion of Historic Resources Study to Innu Elders by Nalcor Archaeologists
February 16, 2010	St. John's, NL	13	Initialling of the IBA and the Upper Churchill Redress Agreement
June 28, 2010	Conference Call	3	Discussion of Innu Land Use Study
June 29, 2010	Sheshatshiu, NL	34	Presentation and discussion of the Lower Churchill Hydroelectric Generation Project and the Transmission Link
July 9, 2010	Conference Call	2	Discussion of Innu Land Use Study
July 30, 2010	Conference call	3	Discussion of Innu Land Use Study
August 13, 2010	Conference call	3	Discussing draft workplan and data collection guide for Innu Land Use Study jointly developed by Innu Nation and Nalcor
November 3, 2010	Happy Valley-Goose Bay, NL	3	Discussion of information-sharing protocols
November 10, 2010	Conference call	3	Discussion of information sharing and environmental permit review process
June 2, 2011	Sheshatshiu, NL	9	Open House Meeting (see above)
October 6, 2011	St. John's, NL	3	Provide further detail on the archaeological field work at Muskrat Falls
November 18, 2011	Natuashish, NL	Approximately 100	Signing of the IBA

Table 7.2.2-1 Consultations with Innu Nation and Key Outcomes (continued)

Key Questions and Issues Raised	EIS Section
Need for an EIS level review, allowing consideration of alternatives, evaluation of proposed mitigation measures and the development of monitoring programs	Chapter 1 intro, 2.5, 9.3.8, 9.4.6, 11.3, 12.6, 13.4, 14.5, 16.9
Proposed transmission corridor crossings of the Kenamu River	13.2.1.1
Kenamu River's potential eco-tourism development may be affected	NIS[c]
Innu traditional use of the Kenamu River, and the transmission line's potential effect on Atlantic salmon	16.5.5.5, 16.5.6.4
Need to consider an alternative routing south of the Kenamu[d]	2.11.2
Electromagnetic radiation and its potential environmental effects	3.5.3.1, 3.5.3.2, 14.2.6.5, 14.2.7, 16.3.6.5 and 16.3.6.6
Herbicide use and its potential effects on the quality and abundance of food plants such as berries	16.3.6.5
Potential that transmission corridor may encourage more non-Innu trapping in previously remote areas	16.5.6.3
Historic Resources studies should contain sufficient Innu traditional knowledge, especially as they are not prepared by Innu	16.2.5.1
Attitudes and perceptions about land use studies, and the need to ensure that the Innu feel that their input is valued, and how participating will benefit them	16.3.3.1, 16.4.10, 16.5.3.1, 16.5.4.1, 16.5.5.1, 16.5.5.5, 16.5.6.4, 16.9.1 and Table 16.9.1-1
Potential effect of the Project on the Red Wine caribou herd	12.3.5.3, 12.3.6.3
Concerns about potential workplace discrimination	16.4.5.1
Importance of consultation early in the EA process, and that meetings are held in the community, but not scheduled at the same time as other activities	7.1
Concerns that sometimes those who receive training do not get jobs, including lack of jobs for Innu after Project Construction has ended	16.4.5.1
Requirement for full compliance with environmental regulations, and that the proponent and contractors be accountable for ensuring such compliance	3.4, 3.5, 3.6 and Table3-1.1 in Appendix 3-1

(a) Does not include Nalcor participants.
(b) Some meetings included discussion of both the proposed Project and the Lower Churchill Hydroelectric Generation Project, and possibly other projects and issues. The above focuses on content that is related directly to the Project.
(c) NIS – Not in scope. Consideration of the issue raised is outside the scope of the Project.
(d) EIS may not reference the location directly, but provides rationale for route selection.

7.3 Québec Innu and Naskapi

There are 11 Innu communities and one Naskapi community in Québec. The land claim areas of several of these First Nations extend into Labrador, although these have not been accepted for negotiation by the Government of Newfoundland and Labrador.

To date, Nalcor has been engaged in consultation activities with six Québec Innu communities and one Québec Naskapi community in order to provide information on the Project, and to attempt to identify and discuss the nature of any associated interests and issues. The following lists the seven Québec Aboriginal groups that have been consulted to date regarding the Project:

- Pakua Shipi (Saint- Augustin);
- Unamen Shipu (La Romaine);
- Nutashkuan (Natashquan);
- Ekuanitshit (Mingan);
- Uashat mak Mani-Utenam (Sept-Îles);
- Matimekush-Lac John (Schefferville); and
- Kawawachikamach (Naskapi community).

Consultation and information sharing initiatives have varied between groups, as discussed above, based on their respective locations, nature and level of their interests, and their responses. Consultation for the purposes of issue scoping and gathering of Aboriginal Ecological Knowledge, has included face-to-face meetings, written correspondence, the provision of Project-related information (including brochures and fact-sheets prepared specifically for this purpose and translated into French), and / or the negotiation and implementation of proposed community engagement agreements through various meetings, conference calls, telephone calls and emails. Sources of Aboriginal Ecological Knowledge include, but are not limited to, land use surveys and interviews, reviews of existing published and unpublished literature, and through the provision of information to Nalcor by an Aboriginal group.

7.3.1 Proposed Aboriginal Engagement Agreements and Other Initiatives (2009)

The purpose of the proposed 2009 Community Engagement Agreements was to establish a collaborative and cooperative framework, supported by funding, for the exchange of Project-related information between Nalcor and each relevant Aboriginal group. This was intended to help identify any questions and concerns about the projects and potential effects, for consideration in project planning and EA, and to gather additional information on current land use activities and any relevant traditional knowledge. Nalcor recognizes that populations living in proximity to the Project may have traditional and community knowledge which could be incorporated into the assessment of the effects of the Project, and their mitigation. Aboriginal traditional and community knowledge of the existing environment will be incorporated into the EIS, to the extent that the information is available to Nalcor. The associated workplan would see both parties working jointly in the community to understand and address issues and concerns the community may have regarding the projects.

Nalcor's originally proposed Aboriginal community engagement agreements pertained to both the Project and Lower Churchill Hydroelectric Generation Project, in order to help optimize consultation efficiency and to reduce overall demands on the Aboriginal communities and their resources. It was intended, however, that the nature, level and focus of the associated consultation with each group on each project would vary, based on a group's particular interests, location and activities in relation to the transmission and / or generation projects. Given the relatively advanced stage of the Lower Churchill Generation Project’s EA at the time, discussions and activities related to these initial agreements (where concluded) focussed primarily on that project.

In May 2009, several groups (i.e., Pakua Shipi, Unamen Shipu, Nutashkuan, Ekuanitshit, Uashat mak Mani-Utenam, Matimekush-Lac John) were provided with a copy of Nalcor's proposed Aboriginal community engagement agreement, and were invited to review the draft agreement to indicate their response to the terms of the agreement.

Almost a year after the initial proposal was tabled, and despite extensive efforts by Nalcor, an agreement was successfully finalized with the community of Pakua Shipu on April 29, 2010. The Parties developed a jointly agreed upon workplan and work scope for the exchange of Project-related information, identification of community concerns and the collection of contemporary land use information.A second agreement was also signed with representatives of Unamen Shipu on June 17, 2011, allowing for the exchanges of Project information and the collection of land and resource use data. Consultation activities and data collection under that agreement remains in progress. Regardless of the outcome of discussions and negotiations of agreements with these Aboriginal communities, Nalcor has continued to attempt to engage in consultation activities related to the Project with the communities of Nutashkuan, Ekuanitshit, Uashat mak Mani-Utenam and Matimekush-Lac John through meetings, conference calls, phone calls and emails.

In addition, although there was no formalized consultation agreement put in place with Naskapi Nation of Kawawachikamach, Nalcor has and will continue to provide this community with Project-related information and opportunities to identify any interests, issues and concerns.

7.3.2 Proposed Aboriginal Engagement Agreements and Other Initiatives (2010 and 2011)

In 2010, Nalcor moved forward with planning and attempting to carry out an Aboriginal consultation program focussed specifically on the proposed Project and its EA.

The continued consultation has sought to negotiate consultation agreements so as to identify issues and concerns and to continue to collect land use information. In January 2011, a second phase of the above-described Community Engagement Agreement was signed with the Innu of Pakua Shipu, with the objective of continuing consultation with a focus on the Project. Under this agreement, additional information is being collected on potential Project-related issues and concerns, and on any land and resource use in or near the proposed transmission corridors and associated traditional knowledge.

On June 17, 2011, an agreement was signed with representatives of Unamen Shipu allowing for the exchanges of Project information and the collection of land and resource use data. Consultation activities and data collection under that agreement remains in progress.

While formal consultation agreements have not been pursued with the remaining Québec Innu communities or with Naskapi Nation of Kawawachikamach, Nalcor continues to engage in (or offer) consultation with these groups respecting the Project through the provision of information and, with the agreement of the community, through workshops and community meetings to identify any interests and particular issues and concerns.

7.3.3 Summary of Project-Related Consultation Activities with Québec Innu and Naskapi Communities

A summary of the specific consultation initiatives are provided in Table 7.3.3-1, as well as an overview of the key questions and issues raised and where these are addressed in this EIS.

Table 7.3.3-1 Consultations with Québec Innu and Naskapi Communities and Key Outcomes

Date	Location and Group	Number of Participants[(a)]	Purpose and Focus[(b)]
October 22, 2008	Nutashkuan, Québec (QC)	15	Discussion of the Project and its EA, including the transmission of power from Labrador to the Island
January 12, 2009	Uashat, QC (Uashat mak Mani-Utenam)	30	Discussion of the Project and its EA
January 15, 2009	Pakua Shipi, QC (Pakua Shipi)	5	Presentation and discussion of the Project and the EA process
January 16, 2009	Unamen Shipu, QC (Unamen Shipu)	5	Presentation and discussion of the Project and the EA process
June 1, 2009	Ekuanitshit, QC (Ekuanitshit)	6	Discussion of Project and associated issues, including the transmission of power from Labrador to the Island, and a potential consultation agreement
August 6, 2009	Québec City, QC (Nutashkuan)	3	Presentation and discussion of the Project and a potential consultation agreement
January 26, 2010	Québec City, QC (Nutashkuan)	4	Discussion of a potential consultation agreement
January 27, 2010	Québec City, QC (Ekuanitshit)	4	Discussion of a potential consultation agreement
January 27, 2010	Québec City, QC (Pakua Shipi)	3	Discussion of a potential consultation agreement
January 29, 2010	Québec City, QC (Unamen Shipu)	10	Discussion of a potential consultation agreement
March 24, 2010	St. John's, NL (Unamen Shipu)	5	Discussion of a potential consultation agreement
April 26, 2010	St. John's, NL (Pakua Shipi)	3	Signing of Community Engagement Agreement
May 5, 2010	Montréal, QC (Pakua Shipi)	2	Discussion of the workplan associated with the Community Engagement Agreement
June 10, 2010	Pakua Shipi, QC (Pakua Shipi)	1	Discussion of the interview guide for the land and resource use study and execution of the workplan
June 14, 2010	Pakua Shipi, QC (Pakua Shipi)	1	Discussion of roles and responsibilities of the Community Coordinator
June 14, 2010	Pakua Shipi, QC (Pakua Shipi)	2	Discussion of land and resource use studies and interview guide
June 15, 2010	Pakua Shipi, QC (Pakua Shipi)	6	Discussion of the Community Engagement Agreement and the associated land use study
June 16, 2010	Pakua Shipi, QC (Pakua Shipi)	3	Discussion of land use study methodology and interview guide
June 29, 2010	Pakua Shipi, QC (Pakua Shipi)	2	Discussion of land use interview methodology and data analysis
June 29 to July 13, 2010	Pakua Shipi, QC (Pakua Shipi)	22	Conducted interviews with 21 individuals in the community for the land use study, and discussion of study report preparation

Table 7.3.3-1 Consultations with Québec Innu and Naskapi Communities and Key Outcomes (continued)

Date	Location and Group	Number of Participants[a]	Purpose and Focus[b]
July 21 to 29, 2010	St. John's, NL (Pakua Shipi)	1	Series of meetings to compile notes from interviews and begin to prepare a report presenting interview results to the community of Pakua Shipi
September 13, 2010	Ekuanitshit, QC (Ekuanitshit)	8	Executive briefing, Project description and discussion
October 12, 2010	Pakua Shipi, QC (Pakua Shipi)	1	Discussion of progress of the Community Engagement Agreement and deliverables
October 13, 2010	Pakua Shipi, QC (Pakua Shipi)	5	Discussion of presentation of interview results to community, as well as next steps
October 13, 2010	Pakua Shipi, QC (Pakua Shipi)	1	Discussion of logistics for the community meeting to be held in October 2010. Also discussed the data authentication process to validate the data collected during interviews with community members
October 14, 2010	Pakua Shipi, QC (Pakua Shipi)	2	Further interviews with community members who are hunting on the land
October 25, 2010	Pakua Shipi, QC (Pakua Shipi)	1	Description of the Project, the EA process and the role of the Community Consultation Coordinator
October 25, 2010	Pakua Shipi, QC (Pakua Shipi)	4	Discussion of a Phase II Agreement to carry out further land use study for the Project
October 25, 2010	Pakua Shipi, QC (Pakua Shipi)	12	Presentation and validation of the results of the land use interviews to community members
November 24, 2010	Pakua Shipi, QC (Pakua Shipi)	2	Discussion of the financial details of the Community Engagement Agreement and Phase II of the Agreement
November 24, 2010	Pakua Shipi, QC (Pakua Shipi)	2	Sharing financial details of the Agreement with the co-manager
November 24, 2010	Pakua Shipi, QC (Pakua Shipi)	5	Provided an update on the status of the Community Engagement Agreement and next steps
January 11, 2011	Québec City, QC (Pakua Shipi)	1	Discussion of the Phase I Community Engagement Agreement, including the submission of the final report by Pakua Shipi
February 11, 2011	Québec City, QC (Pakua Shipi)	1	Planning of the Phase II Community Engagement Agreement
February 23, 2011	Pakua Shipi, QC (Pakua Shipi)	6	Executive briefing regarding the Project and the Phase II Community Engagement Agreement
February 23, 2011	Pakua Shipi, QC (Pakua Shipi)	6	Open house to describe and discuss the Project, EA process, environmental studies, and engagement with Aboriginal communities
April 19 to 20, 2011	Pakua Shipi, QC (Pakua Shipi)	3	Planning for the Phase II of the Community Engagement Agreement
May 17 to 18, 2011	Pakua Shipi, QC (Pakua Shipi)	3	Series of meetings held in Pakua Shipi on May 17 to 18, 2011 for execution of Phase II Community Engagement Agreement, including progress of land use interviews

Table 7.3.3-1 Consultations with Québec Innu and Naskapi Communities and Key Outcomes (continued)

Date	Location and Group	Number of Participants[a]	Purpose and Focus[b]
June 17, 2011	St. John's, NL (Unamen Shipu)	3	Signing of Community Engagement Agreement
June 20, 2011	Ekuanitshit, QC (Ekuanitshit)	5	Executive meeting with Band Council regarding the Project and its EA
June 20, 2011	Ekuanitshit, QC (Ekuanitshit)	30	Project presentation to community members of Ekuanitshit
July 12, 2011	Pakua Shipi, QC (Pakua Shipi)	8	Community information session to review preliminary results from land use interviews, provide Project information, and answer any questions from community members
November 4, 2011	Québec City, QC (Unamen Shipu)	4	Implementation of the Community Engagement Agreement
November 14 and 15, 2011	Québec City, QC (Unamen Shipu)	2	Implementation of the Community Engagement Agreement
December 6, 2011	La Romaine, QC (Unamen Shipu)	9	Review of Work Plan for Community Engagement
January 19, 2012	La Romaine, QC (Unamen Shipu)	8	Band Council meeting to discuss the revised work plan and to discuss the forth coming meeting that night
January 19, 2012	La Romaine, QC (Unamen Shipu)	49	Presentation of the Project to the community members

Key Questions and Issues Raised	EIS Section
The transmission line crosses hunting grounds and potential effects on ability to hunt and trap	16.5.5.5, 16.5.6.4
Potential effects of the Project on caribou, particularly on the Red Wine Mountain and the Mealy Mountains Caribou Herds, as well as other wildlife	12.3.5.3, 12.3.6.3, 12.4.5, 12.4.6
Potential effects of the Project on traditional activities, particularly on access, hunting, trapping and fishing	16.5.5.5, 16.5.6.4
Potential effect of Project employment on ability to go into the woods to make a living through hunting, trapping and fishing	16.5
Potential effects of the installation of subsea cables in the Strait of Belle Isle on salmon, which migrate through the Strait	14.2.6.5, 14.2.7
Concern about the use of pesticides and their potential effects on wildlife and berries and the associated potential human health effects	16.3.6.5
Whether the access trails used for construction of the transmission line will be preserved and accessible to the public	3.4.6.2
Desire for meaningful consultation	7.1
Project-related information should be provided in Innu-aimun	Plain Language Summary
Concerned that various Innu groups are being treated differently	7.1
Comment that regardless of whether Nalcor is reducing or mitigating environmental effects, there will still be some effects on the environment	1.3, Chapter 17, Table 17.5-1
Potential for community economic benefits if people cannot work in Labrador	16.4.5.1, 16.4.10
Desire for an IBA, as the transmission lines go through their territory and land claims areas	7.3

Table 7.3.3-1 Consultations with Québec Innu and Naskapi Communities and Key Outcomes (continued)

Key Questions and Issues Raised	EIS Section
The eventual use of wood from the clearing of the right-of-way (ROW)	12.2.5.8
Interest in employment and business opportunities	16.4.1 and 16.4.5.4
Desire to see the transmission line follow the Trans-Labrador Highway (TLH) all the way to the Strait of Belle Isle instead of cutting through the in-land territory	2.11.2
Alternative transmission corridors and their consideration	2.11.2, 2.12.6,
Consideration of other, potentially more environmentally friendly energy alternatives such as wind or solar	2.5
EA approach for the Project	1.3, Chapter 9
Need to ensure that if the Project is approved and proceeds, all the commitments made are implemented and enforced	NIS[c]
Potential dangers of subsea cables on marine and human life	14.2.6.5, 14.3.6, 16.3.6.4
Potential effects on climate change	11.2.5.3, 11.2.6.3, 11.2.7
Potential effects on medicinal plants	16.5.5.5, 16.5.6.4
Lack of financial resources to use the territory	NIS[c]
Potential for environmental degradation affecting animals, plants, and water bodies	Chapters 11 to 14; 17.6.1, 17.6.2
Concern for community health issues and the need for sources of revenue to improve access to health services	15.3.6.7, 16.3.5.6, 16.3.5.7, 16.3.6.5, 16.3.6.6, 16.3.7.1, Table 16.3.7-1
Concern that significant traditional knowledge of the environment will not be considered in the environmental evaluation process	7.1, 9.5.3, Chapters 11 to 14, Chapter 16, 16.10
Unsure of the need for more electricity and what markets would be supplied	2.2, 2.3
Would like to negotiate compensation or special programs	7.1

(a) Does not include Nalcor participants.

(b) Some meetings included discussion of both the proposed Project and the Lower Churchill Hydroelectric Generation Project, and possibly other projects and issues. The above focuses on content that is related directly to the Project.

(c) NIS – Not in scope. Consideration of the issue raised is outside the scope of the Project..

7.4 Labrador Inuit

The Inuit of Labrador are an arctic-adapted people who migrated across the Canadian Arctic from Alaska and reached Labrador in approximately AD 1300. By the late eighteenth century the Inuit had established themselves along portions of the Labrador coast. The Inuit were a mobile people, but their harvesting efforts focused on the sea. As Europeans settled the Labrador coast, the Labrador Inuit became less mobile and participated increasingly in the fishery and fur trade.

Labrador Inuit are now primarily resident in the north Labrador Inuit communities of Nain, Hopedale, Makkovik, Postville and Rigolet, and in the Central Labrador communities of North West River and Happy Valley-Goose Bay. LILCA, signed by the Labrador Inuit, the Government of Canada and the Province of Newfoundland and Labrador in January 2005, came into effect on December 1 of that year. The Agreement is a modern comprehensive treaty, and sets out the details of land ownership, resource sharing and self-government in the area covered by the Agreement in Northern Labrador. It also resulted in the establishment of the Nunatsiavut Government, which represents the over 6,000 beneficiaries of the Agreement.

Information and documentation supplied by the Labrador Inuit in the course of land claims negotiations and as evidenced in the *Labrador Inuit Land Claims Agreement* does not indicate historical use and occupancy by the Labrador Inuit of the land and resources within the proposed Project area. Although the proposed Project does not cross through or near the land areas covered by the *Labrador Inuit Land Claims Agreement*, Nalcor has met with the Nunatsiavut Government and other Inuit organizations and individuals in order to provide Project information and receive and consider Inuit views on the Project and its potential environmental effects and benefits.

An open house was also held by Nalcor on May 31, 2011, in the Labrador Inuit community of Hopedale. Prior to the open house session, public notification activities included newspaper advertisements, public notices, and direct invitations. This included advertisements in The Labradorian and The Northern Pen newspapers on May 23 and 30, 2011, as well as radio advertisements, direct distribution of public notices and its posting on the Nalcor website, and a press release issued by Nalcor.

The open house took place at the Amos Comenius Memorial School in Hopedale from 4:30 to 8 pm. Upon arrival, participants were welcomed by a Project team member who provided an overview of the open house session. There were a total of six information stations, a sign-in table, feedback table, and refreshment table, similar to the Sheshatshiu open house session (Section 7.2.1.2). A total of 29 people attended the Hopedale open house.

A summary of the consultation initiatives undertaken to date with the Labrador Inuit (Nunatsiavut Government, Inuit Community Governments and Corporations) is provided in Table 7.4-1, as is an overview of the key questions and issues raised and an indication of where these are addressed in this EIS.

Table 7.4-1 Consultations with the Labrador Inuit and Key Outcomes

Date	Location	Number of Participants[(a)]	Purpose and Focus[(b)]
April 11, 2008	Happy Valley-Goose Bay, NL	3	General discussion of the Project
May 14, 2008	St. John's, NL	3+	General discussion of the Project, the EA process, and energy markets
September 16, 2008	Rigolet, NL	5	General discussion of the Project
February 12, 2009	Happy Valley-Goose Bay, NL	1	Presentation and discussion of the Project, environmental baseline studies and the EA process
December 16, 2009	St. John's, NL	1	Presentation and discussion of the Project, environmental baseline studies and the EA process
July 21, 2010	Rigolet, NL	5	General discussion of the Project
May 31, 2011	Hopedale, NL	29	Open House Meeting (see above)

Key Questions and Issues Raised	EIS Section
Electricity needs of Labrador Inuit communities	
The need for further details on the Project description (e.g., towers, ROW, electrodes, construction methods)	Chapter 3
Overall rationale for the Project and the need to consider effects and benefits together for this development	Chapter 2
Perceived knowledge gap with respect to baseline information for Lake Melville and potential role of Inuit knowledge	7.1, 9.5.5

(a) Does not include Nalcor participants.
(b) Some meetings included discussion of both the proposed Project and the Lower Churchill Hydroelectric Generation Project, and possibly other projects and issues. The above focuses on content that is related directly to the Project.

7.5 NunatuKavut Community Council

The Labrador Metis Association was established in 1985, and renamed the Labrador Métis Nation (LMN) in 1998. The organization was again recently renamed the NunatuKavut Community Council (NCC) in February 2010. NCC reports a membership of over 6,000 members, who reside primarily in Central Labrador and along its southeastern coast. NCC members have asserted a land claim that covers much of Labrador, but this has not been accepted for negotiation by the Governments of Canada and Newfoundland and Labrador.

Nalcor's consultation activities with NCC for the purpose of issue scoping and gathering Aboriginal Traditional Knowledge has included a number of initiatives over recent years, including written correspondence, meetings with NCC representatives, the provision of information packages and other data, Project presentations and updates, and ongoing discussions and information exchange by telephone, email and through other means. Sources of Aboriginal Ecological Knowledge collected from NCC include, but are not limited to, land use surveys and interviews, reviews of existing published and unpublished literature, and through the provision of information to Nalcor by NCC.

7.5.1 Community Engagement Agreements

After several years of consultation efforts and associated discussions and negotiations between Nalcor and the NCC, a formal consultation agreement was signed between the Parties in December 2009.

As noted previously, Nalcor's originally proposed Aboriginal community engagement agreements pertained to both the Project and Lower Churchill Hydroelectric Generation Project, in order to help optimize consultation efficiency and to reduce overall demands on the communities and their resources. Given the relatively advanced stage of the Lower Churchill Generation Project's EA at the time, discussions and activities related to these initial agreements (where concluded) focussed primarily on that project. The outcome of the December 2009 agreement between Nalcor and NCC was a report to Nalcor which generally outlined some of NCC members' perspectives and concerns regarding the proposed projects. This Agreement expired on March 31, 2010.

Following the conclusion of the 2009-2010 agreement, negotiations to enter into a Phase II agreement focussed on the Project commenced in March 2010. In January 2011, that agreement was signed between NCC and Nalcor, to provide further Project information, and to gather additional information on the questions and concerns of NCC members regarding the Project and its potential effects, as well as on NCC land use activities and knowledge, recognizing that populations living in proximity to the Project may have substantial and distinct knowledge which may be relevant to the Project and its EA.

Under the 2011 Agreement, Nalcor personnel have provided Project information, and have travelled with NCC representatives to 10 Labrador communities where many of the NCC membership reside, in order to provide Project information through presentations at community meetings. In addition, approximately 150 surveys have been conducted with NCC members to identify Project-related issues and questions, and a further 30 land use interviews have been conducted. A draft version of the "Contemporary Land and Sea Uses" report was received by Nalcor on December 16, 2011. The information and data obtained by Nalcor as a result of this agreement has been incorporated into this EIS.

7.5.2 Summary of Project-Related Consultation Activities with NunatuKavut Community Council

A summary of consultation initiatives with NCC to date is provided in Table 7.5.2-1, as well as an overview of the key questions and issues raised and where these are addressed in this EIS.

Table 7.5.2-1 Consultations with NunatuKavut Community Council and Key Outcomes

Date	Location	Number of Participants[(a)]	Purpose and Focus[(b)]
April 17, 2007	Happy Valley-Goose Bay, NL	3	General discussion of the Project and the EA process
February 26, 2008	Happy Valley-Goose Bay, NL	5	Discussion of various issues, including the transmission of power from Labrador to the Island
July 31, 2008	Happy Valley-Goose Bay, NL	4	Discussion of consultation and next steps
April 7, 2009	Happy Valley-Goose Bay, NL	1	Discussion of the electrode components of the Project
April 23, 2009	Happy Valley-Goose Bay, NL	1	Discussion of potential consultation agreement
June 11, 2009	St. John's	1	Discussion of potential consultation agreement
July 2, 2009	Conference Call	3	Discussion of potential consultation agreement
November 5, 2009	St. John's, NL	2	Discussion of potential consultation agreement
December 10, 2009	Happy Valley-Goose Bay, NL	4	Discussion of the workplan and budget associated with the consultation agreement, resulting in the initialling of the agreement
December 11, 2009	St. John's, NL	1	Signing of the consultation agreement.
January 20, 2010	St. John's, NL	3	Discussion and development of a work plan associated with the consultation agreement
January 26, 2010	Happy Valley-Goose Bay, NL	3	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
February 28, 2010	L'Anse au Clair, NL	80	Presentation at NCC Annual General Meeting
March 1, 2010	Charlottetown, NL	80	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
March 2, 2010	Port Hope Simpson, NL	6	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
March 2, 2010	Happy Valley-Goose Bay, NL	50	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
March 2, 2010	Happy Valley-Goose Bay, NL	7	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
March 3, 2010	Cartwright, NL	6	Information meeting regarding the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link
March 25, 2010	St. John's, NL	3	Discussion of potential consultation agreement
May 19, 2010	Conference Call	3	Discussion of next steps for consultation

Table 7.5.2-1 Consultations with NunatuKavut Community Council and Key Outcomes (continued)

Date	Location	Number of Participants[(a)]	Purpose and Focus[(b)]
May 25, 2010	Happy Valley-Goose Bay, NL	2	Discussion and presentation of an update on the Labrador – Island Transmission Link and its EA and associated environmental studies
July 30, 2010	St. John’s, NL	2	Discussion of consultation next steps
January 19, 2011	Happy Valley-Goose Bay, NL	3	Signing of consultation agreement - Phase II
February 17, 2011	Happy Valley-Goose Bay, NL	5	Draft work plan, interview guide, survey, and map of study area.
February 21, 2011	St. John’s, NL	1	Implementation of the Phase II consultation agreement
March 14, 2011	Red Bay, NL	5	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 14, 2011	Forteau, NL	16	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 15, 2011	Mary’s Harbour, NL	9	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 15, 2011	St. Lewis (Fox Harbour), NL	9	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 16, 2011	Port Hope Simpson, NL	17	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 17, 2011	Norman Bay, NL	9	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 22, 2011	Charlottetown, NL	23	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 23, 2011	Cartwright, NL	16	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
March 30 to April 1, 2011	Happy Valley-Goose Bay, NL	5	Workshop on land use study and survey approach and methodology
April 5, 2011	St. John’s, NL	4	Meeting to discuss process issues with Agreement Phase II
April 25, 2011	Happy Valley-Goose Bay, NL	14	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues

Table 7.5.2-1 Consultations with NunatuKavut Community Council and Key Outcomes (continued)

Date	Location	Number of Participants[a]	Purpose and Focus[b]
April 26, 2011	Labrador City, NL	11	Open meeting with NCC membership and general public to discuss Project, EA, environmental studies, questions and issues
May 4, 2011	Mary's Harbour, NL	2	Meeting to discuss process issues with Agreement Phase II

Key Questions and Issues Raised	EIS Section
EA approach, including need for a comprehensive and thorough assessment	1.3, Chapter 9
Electricity requirements of Labrador coastal communities	NIS[d]
Potential effects on local trappers as the corridor passes through traditional trapping grounds	16.5.5.5, 16.5.6.4
Need for consultation and traditional knowledge collection, including resources to do so	7.1
Potential effects on the aquatic environment, specifically on "trophy sized" brook trout in Labrador	13.3.5.3, 13.3.6.3, 13.3.5.4, 13.3.6.4
Potential effects on migratory birds	12.5.5, 12.5.6, 14.4.5.3, 14.4.6.3
Possible fragmentation of caribou habitat resulting from transmission line construction	12.3.5, 12.3.6
Potential effect on caribou as a result of predator use of the corridor, including wolves, coyotes and bears	12.3.6.3, 12.3.5.3, 12.3.9, 12.3.7
Cable crossing of Strait of Belle Isle scallop beds and ability of NCC members to harvest scallops in the area	16.6.6.3
Ability of marshy or boggy land in-land to support structures for the power lines	3.4.3.2
Potential for the transmission line to follow Phase 2 and 3 of the TLH instead of building a new road to service / build the lines	3.2, 2.11.2
Potential effects of heavy equipment and herbicide use during construction and maintenance, as the marshes supply the freshwater supply in some of the southern Labrador communities	13.2.5, 13.2.6, 13.2.7
Suggestion that the proposed converter station at Soldiers Pond be located in Labrador	2.11.2, 2.12.2, 3.2
Potential Project-specific and cumulative effects on fish stocks, specifically the spawning grounds of the Alexis / St. Lewis River, which will be close to the transmission corridor[c]	13.3.5, 13.3.6, 13.3.7, 13.3.9
The need for Labrador to benefit from large-scale resource developments	2.1, 16.4.5.1
Advanced notice required for meetings so people can attend	3.4.1.1, 7.1, 7.5.1
Potential increased access to fish and mammals	12.3.5, 12.3.6, 12.3.7, 12.4.5, 12.4.6, 12.4.7, 13.3.5, 13.3.6, 13.3.7
Potential increase in poaching	12.3.5.3, 12.3.6.3
Potential increase in marten trapping along the corridor	12.4.5.3
Perceived EMF effects on health, including animal tissues, miscarriages amongst women, leukemia in children, breast cancer, and the disruption of defibrillators	16.3.6.5
Call for equal benefits for all Aboriginal people and groups	7.1, 16.4.5
Potential for the transmission lines to be put underground to minimize any visual effects	16.8.5.1
Potential effects of the Project on Labrador electricity rates	2.8.1

Table 7.5.2-1 Consultations with NunatuKavut Community Council and Key Outcomes (continued)

Key Questions and Issues Raised	EIS Section
The need for the Project to not proceed until there has been a full environmental review and approval	1.3
The nature and rationale for the use of sea electrodes vs. shore electrodes	2.12.5
Potential effects of chemical use in vegetation control along the ROW	16.5.6.4
Perception that Project should wait until it is known whether there is a market for Gull Island power	2.2, 2.3, 2.5.13.3
Potential to import power from the North American grid	2.5.14
Concern about how the business opportunities in the Innu IBA would affect NCC members' ability to bid on Project contracts	16.4.5.1, 16.4.6.3
Access to wood cleared from the transmission line ROW	3.4.3.2, 16.5.5.1, 16.9.1
Ensuring rigorous and unbiased environmental studies for the Project and its EA	1.5
The need for electricity in Labrador to attract economic development. Access to recall power if needed for industry	2.3.1, 2.5.13.2
Potential effects on fisheries due increased siltation in water during the installation of the electrodes	14.2.5, 14.2.7
The need for "clean" energy in today's world	1.1
The potential environmental effects of electro-magnetic fields	3.5.3.2, 14.2.6, 14.2.6, 14.3.6
The need to ensure that all construction sites are cleaned up afterwards	3.4.6.5
The need to have Aboriginal / community environmental monitors in place	7.1
Full explanation of the environmental studies is required	Chapter 10, Chapter 15
Potential effects of an earthquake on the Strait of Belle Isle aspects of the Project	4.10.1
Potential effects of the Strait of Belle Isle cables and the electrode on marine fish	14.2.6.5, 14.2.5.4
Potential Project effects on caribou	12.3.5
Concerns about the effects of the transmission line on berries	16.5.5.5, 16.5.6.4
The need for long-term jobs in the region	16.4.5.4 and 16.4.6.4
Opening of the territory through transmission ROW and access roads	16.5.5.3
Proximity of proposed transmission corridor to float plane landing point at Forteau area, which could affect local chartering business	16.5.5.3
The need for reliable power	1.1, 2.1, 2.2
Potential effects of transmission line passing through communities' drinking water supplies	16.3.6.5, 16.5.5.3
Economic benefits such as funding for roads and healthcare	7.1, 15.3.6.7, 16.4.5.1
Process for placing rock over the Strait of Belle Isle cables and its possible effects on crab and fish such as turbot, halibut and cod, which dwell on the ocean floor	13.4.3.3, 14.2.5
Potential effects of the Project on salmon, trout and char	13.3.5, 13.3.6, 13.3.7
Concern with water levels within rivers decreasing	13.2
Concern there will be an increase in the osprey population putting added pressure on fish resources	12.5.6.5

Table 7.5.2-1 Consultations with NunatuKavut Community Council and Key Outcomes (continued)

Key Questions and Issues Raised	EIS Section
Concern the construction of the ROW will disturb soil along ponds, rivers and lakes affecting the fish	13.2.5, 13.3.5

(a) Does not include Nalcor participants.

(b) Some meetings included discussion of both the proposed Project and the Lower Churchill Hydroelectric Generation Project, and possibly other projects and issues. The above focuses on content that is related directly to the Project.

(c) EIS may not reference the location directly, but provides rationale for route selection.

(d) NIS – Not in scope. Consideration of the issue raised is outside the scope of the Project.

NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 8

Regulatory and Public Consultation and Issues Scoping

April 2012

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Acronym	Description
%	percent
ac	alternating current
ATV	all-terrain vehicle
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CS	Component Study
EA	Environmental Assessment
EBSA	Ecologically and biologically significant area
EIS	Environmental Impact Statement
EMF	electromagnetic field
EMS	Environmental Management System
EPP	Environmental Protection Plan
HDD	Horizontal Directional Drill
IATNL	International Appalachian Trail Newfoundland and Labrador
ISO	International Organization for Standardization
km	kilometre
LEK	Local Ecological Knowledge
ML/ARD	metal leaching and acid rock drainage
NL	Newfoundland and Labrador
NOC	National Occupation Classification
NS	Nova Scotia
ON	Ontario
Project	Labrador-Island Transmission Link
ROW	right-of-way
SHERP	Safety, Health and Environmental Emergency Response Plan
SSAC	Species Status Advisory Committee
VEC	Valued Environmental Component

8 REGULATORY AND PUBLIC CONSULTATION

Consultation is the cornerstone of the environmental assessment (EA) process, and is a key aspect of the Nalcor Energy (Nalcor) approach to its planning and development activities. Meaningful consultation can take place when the public has a clear understanding of the nature of the Project early in the EA process. Section 2 of the Environmental Impact Statement (EIS) Guidelines recommends the proponent provide up-to-date information, as it becomes available, to the public and especially to communities likely to be affected by the Project; involve the main interested parties in determining how best to deliver the information, the type of information that is required, format and presentation methods and the need for community meetings; and to provide explanations of the results of the EIS in a clear and direct manner to make the issues comprehensible to a wide audience. The consultation and associated issues scoping activities for the Labrador-Island Transmission Link (Project) involving government departments and agencies, stakeholder groups and the general public are based on these guiding principles, and are described and summarized in this chapter.

Nalcor's consultative initiatives have been designed and implemented from both an "*information out*" and an "*information in*" perspective - using various mechanisms to provide interested and potentially affected groups and individuals with information on the Project, allowing them to review and consider this information and formulate their questions and issues, and then giving them the opportunity to provide their perspectives to Nalcor for consideration in Project planning and the EA. A key purpose and objective of Nalcor's consultation program to date has therefore been to identify questions, concerns and issues related to the Project and its potential environmental effects which require consideration in the EIS.

Over the past few years, nearly 100 meetings have been held with regulatory and / or stakeholder organizations. Nalcor held 12 open houses across the province focused specifically on the Labrador-Island Transmission Link EA in 2010 and 2011. In addition, 17 open houses were held across the province in 2011 that provided information on and discussion of the Project. During these consultation activities, questions and issues related to the Project have been identified and recorded, and are summarized in this chapter.

The following chapter also highlights the EIS Guidelines and Scoping Document requirements for the EIS, including Project-related information, aspects of the existing biophysical and socioeconomic environments, potential environmental issues and interactions, and other factors.

8.1 Consultation with Government Departments and Agencies

A summary of the Project-related consultation activities involving provincial and / or federal government departments or agencies is provided in Table 8.1-1, with a focus on face-to-face meeting events and associated discussions. This includes information on the specific department or agency consulted, location, number of participants, and the general purpose and focus of each meeting. Nalcor's consultation activities with government departments and agencies have also included extensive discussions and ongoing information sharing through various other means (e.g., letters, email, telephone conversations).

8.2 EIS Guidelines and Scoping Document

In January 2011, the provincial and federal governments issued the *Environmental Impact Statement Draft Guidelines and Scoping Document* (Government of Newfoundland and Labrador and Government of Canada 2011a) for the Project's EA for public review and comment. These were finalized in May 2011 (Government of Newfoundland and Labrador and Government of Canada 2011b) and issued to Nalcor to guide its preparation of the EIS.

The EIS Guidelines and Scoping Document specifies a range of information and issues to be addressed in the EIS, including Project-related information, aspects of the existing biophysical and socioeconomic environments, potential environmental issues and interactions, and other factors. This information is captured in a detailed Table of Concordance is provided in Appendix 8-1.

Table 8.1-1 Meetings with Government Departments and Agencies

Date	Department/Agency	Location	Number of Participants[(a)]	Purpose and Focus
May 27, 2008	Environment Canada, Canadian Wildlife Service	Mount Pearl, Newfoundland and Labrador (NL)	4	Project overview, planning and design of environmental baseline studies for the Project
May 28, 2008	Department of Environment and Conservation, Wildlife Division	Corner Brook, NL	3	Project overview, planning and design of environmental baseline studies for the Project
June 19, 2008	Department of Tourism, Culture and Recreation, Provincial Archaeology Office	St. John's, NL	1	Project overview, planning and design of historic resources studies for the Project
June 20, 2008	Fisheries and Oceans Canada	St. John's, NL	5	Project overview, planning and design of freshwater fish and fish habitat, and water resources study for the Project
June 27, 2008	Fisheries and Oceans Canada	St. John's, NL	5	Planning and design of marine flora, fauna and habitat studies for the Project
July 15, 2008	Department of Environment and Conservation, Environmental Assessment Division	St. John's, NL	2	Project overview, environmental studies and EA process for the Project
July 17, 2008	Natural Resources Canada, Major Projects Management Office; Fisheries and Oceans Canada; Environment Canada; Transport Canada; Canadian Environmental Assessment Agency; Health Canada; Department of Environment and Conservation, Environmental Assessment Division	Ottawa, Ontario (ON)	17	Project overview, environmental studies and EA process for the Project
July 29, 2008	Transport Canada, Environmental Affairs	St. John's, NL	2	Project overview and Transport Canada's potential regulatory interest in the Project
July 31, 2008	Environment Canada	Mount Pearl, NL	1	Project overview and Environment Canada's potential regulatory interest in the Project
August 21, 2008	Parks Canada	Rocky Harbour, NL	3	Presentation and discussion of the Project and the previously proposed transmission corridor option
August 26, 2008	Fisheries and Oceans Canada	St. John's, NL	2	Project overview and Fisheries and Oceans Canada's potential regulatory interest in the Project

Table 8.1-1 Meetings with Government Departments and Agencies (continued)

Date	Department/Agency	Location	Number of Participants[a]	Purpose and Focus
September 15, 2008	Department of Tourism, Culture and Recreation, Provincial Archaeology Office	St. John's, NL	2	Presentation and discussion of the historic and heritage resources pre-fieldwork assessment report and planned field study for the Project
November 6, 2008	Natural Resources Canada, Major Projects Management Office; Fisheries and Oceans Canada; Canadian Environmental Assessment Agency; Transport Canada; Environment Canada; NL Department of Environment and Conservation	Ottawa, ON	13	Project overview, environmental studies and EA process for the Project
December 16, 2008	Parks Canada	Rocky Harbour, NL	4	Presentation and discussion of the Project and the previously proposed transmission corridor option
February 25, 2009	Fisheries and Oceans Canada, Science Branch	St. John's, NL	5	Discussion of planned marine flora, fauna and habitat survey and freshwater fish and fish habitat and water resources study
March 6, 2009	Parks Canada	Halifax, Nova Scotia (NS)	4	Discussion of the Project and the previously proposed transmission corridor option
May 13, 2009	Environmental Assessment Committee (Including represented provincial and federal departments and agencies)	St. John's, NL	16	Project description, environmental baseline studies, and the EA process for the Project
May 14, 2009	Environment Canada, Canadian Wildlife Service	St. John's, NL	4	Presentation and discussion of the Project and Terrestrial Environment baseline studies
June 9 and 10, 2009	Environmental Assessment Committee (Including represented provincial and federal departments and agencies)	Throughout NL	8 (Day 1) and 4 (Day 2)	Aerial and ground survey of portion of the transmission corridor and Strait of Belle Isle cable landing sites
July 21, 2009	Department of Environment and Conservation, Wildlife Division	Corner Brook, NL	14	Project overview and completed and ongoing baseline studies and potential wildlife issues
September 3, 2009	Department of Tourism, Culture and Recreation, Provincial Archaeology Office	St. John's, NL	2	Project overview and completed and ongoing historic and heritage resources baseline studies
September 10, 2009	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	3	Discussion of and update on the Project and its EA

Table 8.1-1 Meetings with Government Departments and Agencies (continued)

Date	Department/Agency	Location	Number of Participants[a]	Purpose and Focus
September 11, 2009	Department of Environment and Conservation, Environmental Assessment Division	St. John's, NL	2	Discussion of and update on the Project and its EA
September 24, 2009	Natural Resources Canada, Major Projects Management Office	Ottawa, ON	4	Discussion of and update on the Project and its EA
September 29, 2009	Labrador Woodland Caribou Recovery Team (including representatives of government departments and Aboriginal groups)	Port Hope Simpson, NL (via teleconference)	14	Project overview and discussion of key issues related to Labrador woodland caribou
December 16, 2009	Department of Environment and Conservation; Department of Labrador and Aboriginal Affairs; Fisheries and Oceans Canada; Transport Canada; Environment Canada; Canadian Environmental Assessment Agency; Natural Resources Canada, Major Projects Management Office	St. John's, NL	11	Project and EA update, and consultation overview with federal and provincial departments and agencies
December 18, 2009	Environment Canada, Canadian Wildlife Service	St. John's, NL	3	Discussion with Environment Canada on its new approach to managing the incidental take of migratory birds
January 27, 2010	Department of Natural Resources	Happy Valley-Goose Bay, NL	3	Project overview and discussion of land use in Central and Southeastern Labrador
February 23, 2010	Trans-Labrador Highway Phase 3 Environmental Management and Planning Consultative Committee (including representatives of government departments and Innu Nation)	St. John's, NL	20	Presentation and discussion of the Project, with specific attention to the transmission corridor in the southeastern region of Labrador and associated land use issues and planning measures
March 2, 2010	Canadian Wildlife Service, Environment Canada – Caribou Recovery Strategy Workshop	Happy Valley-Goose Bay, NL	10	Environment Canada hosted a workshop on the Caribou Recovery Strategy Workshop with participants sharing their knowledge on Labrador boreal caribou, with a focus on threats
March 22, 2010	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	3	Discussion of status of EA process and associated Aboriginal consultation initiatives

Table 8.1-1 Meetings with Government Departments and Agencies (continued)

Date	Department/Agency	Location	Number of Participants[(a)]	Purpose and Focus
April 5, 2010	Department of Natural Resources	St. John's, NL	2	Project and EA overview, with a discussion of timber resource information, analysis and requirements for the EA
May 27, 2010	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	3	Project and EA update, and discussion of Aboriginal consultation processes and activities
August 9, 2010	Department of Environment and Conservation	St. John's, NL	4	Project and EA update, and discussion of EA timelines and EIS Component Studies
August 18, 2010	Fisheries and Oceans Canada	St. John's, NL	3	Project and EA update and a discussion of associated marine and freshwater environmental studies
September 2, 2010	Natural Resources Canada, Major Projects Management Office	Ottawa, ON	1	Project and EA update, discussion of timelines, EIS preparation, and Aboriginal consultation
September 27, 2010	Dept of Environment and Conservation, Parks and Natural Areas Division	Deer Lake, NL (via teleconference)	1	Project and EA update, discussion of proposed protected area in the Highlands of St. John
September 29, 2010	Labrador Woodland Caribou Recovery Team	Makkovik, NL (via teleconference)	15	Project overview and discussion of key issues related to Labrador woodland caribou
September 30, 2010	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	3	Project and EA update, and discussion of associated Aboriginal consultation processes and activities
November 3, 2010	Department of Environment and Conservation, Wildlife Division	Corner Brook, NL	15	Project overview and update on EA and associated studies
November 18, 2010	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	4	Update on Project description and EA process and associated timelines
November 19, 2010	Fisheries and Oceans Canada	St. John's, NL	7	Update on Project description, particularly its marine components, and ongoing studies and consultation activities
November 23, 2010	Department of Environment and Conservation, Environmental Assessment Division	St. John's, NL	6	Update on Project description and EA process

Table 8.1-1 Meetings with Government Departments and Agencies (continued)

Date	Department/Agency	Location	Number of Participants[(a)]	Purpose and Focus
November 23, 2010	Environment Canada and Transport Canada - NL Region	St. John's, NL	4	Update on Project description and EA process
November 29, 2010	Natural Resources Canada, Major Projects Management Office	Ottawa, ON	1	Update on Project description and EA process and associated timelines
November 30, 2010	Canadian Environmental Assessment Agency	Ottawa, ON	3	Update on Project description and EA process
November 30, 2010	Fisheries and Oceans Canada	Ottawa, ON	2	Update on Project description, particularly its marine components, and ongoing EA and associated consultation activities
January 14, 2011	Department of Environment and Conservation, Parks and Natural Areas Division	Deer Lake, NL	4	Project overview and discussion of transmission corridor with regard to existing parks and protected areas including the Newfoundland T'Railway
January 19, 2011	Department of Labrador and Aboriginal Affairs, Aboriginal Affairs Branch	St. John's, NL	3	Project overview and discussion of Aboriginal consultation initiatives, EIS and component study structure
January 24, 2011	Fisheries and Oceans Canada	St. John's, NL	3	Update on marine project components and the results of 2008-2010 environmental studies, including the regulatory requirements for the marine components
March 8, 2011	Department of Environment and Conservation, Wildlife Division	Corner Brook, NL	3	Project overview and discussion of provincially listed plants
March 10, 2011	Department of National Defence	Happy Valley-Goose Bay, NL	3	Project overview, potential interaction between the Project and Department of National Defence activities in Labrador and associated planning and communications approaches
May 27, 2011	Canadian Environmental Assessment Agency	Halifax, NS	3	Project and EA update, and discussion of Aboriginal consultation process and activities
April 1, 2011	Department of Transportation and Works	L'Anse au Loup, NL	1	Project overview and planned 2011 engineering program
May 25, 2011	Canadian Environmental Assessment Agency (Atlantic Region)	St. John's, NL	1	EA process and EIS structure and planning

Table 8.1-1 Meetings with Government Departments and Agencies (continued)

Date	Department/Agency	Location	Number of Participants[a]	Purpose and Focus
June 16, 2011	Canadian Environmental Assessment Agency	Halifax, NS	5	Project and EA process and consultation update
July 20, 2011	NL Wildlife Division	Corner Brook, NL	3	Discussion of Strait of Belle Isle engineering field program and associated listed plant considerations, including 2011 plant surveys
September 6, 2011	Canadian Environmental Assessment Agency (Atlantic Region)	Halifax, NS	5	Project overview and update on EA and associated studies and EIS structure and planning
September 9, 2011	Department of Environment and Conservation	St. John's, NL	3	Project overview and update on EA and associated studies and EIS structure and planning
September 14, 2011	Department of Environment and Conservation	St. John's, NL	1	Project overview and update on EA and associated studies and EIS structure and planning
December 15, 2011	Department of Environment and Conservation Canadian Environmental Assessment Agency (Atlantic Region)	St. John's, NL	4	Project overview and update on EA and associated studies and EIS Structure and planning.

[a] Does not include Nalcor participants.

8.3 Public and Stakeholder Consultation

A variety of methods and materials have been and are being used to provide all interested stakeholders with opportunities to participate in the EA process for the Project. These have included meetings with individual community and stakeholder groups, public meetings and open houses at locations throughout the province. Nalcor's website (*www.nalcorenergy.com)* also provides relevant information on an ongoing basis, and a toll-free telephone number and dedicated email address have also been established and advertised.

The key purpose of these public and stakeholder consultation initiatives has been to present Project information and to identify questions, issues and other perspectives related to the Project and its potential effects (both adverse and positive) for consideration in the EA, and to collect Local Ecological Knowledge on the existing environment for incorporation into the EIS.

During these public and stakeholder consultation activities, Nalcor has made specific efforts to gather and document information and knowledge from local residents and others on the existing biophysical and socioeconomic environments. This information is presented in Chapters 10 and 15 of this EIS, as relevant.

8.3.1 Stakeholder Consultation Activities

A summary of Project-related consultation initiatives involving the public and stakeholders, including communities, organizations and interest groups, is provided in Table 8.3.1-1. This overview includes the timing, participant(s), location, and purpose and focus of each of these activities.

In addition to the specific meetings and forums listed in the Table 8.3.1-1, Nalcor has also received and responded to Project-related questions and information requests from a number of individuals and organizations by telephone, email and other means. These include the following groups:

- Fish, Food and Allied Workers;
- Four Ponds Outfitting;
- International Appalachian Trail, NL;
- Labrador Straits Development Corporation;
- Labrador Professional Outfitters Association;
- Newfoundland and Labrador Outfitters Association;
- Nordic Economic Development Corporation;
- Parsons Pond Outfitters;
- Portland Creek Hunting and Fishing;
- Protected Areas Association of Newfoundland and Labrador;
- Rack Lake Outfitters;
- Red Ochre Regional Economic Development Board;
- Sierra Club of Canada;
- Southeastern Aurora Development Corporation;
- Town of Daniel's Harbour;
- Town of Forteau;
- Town of North West River;
- Town of Parsons Pond;
- Youth for Environmental Awareness; and
- various interested members of the public.

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups

Date	Group(s)	Location	Number of Participants[(a)]	Purpose and Focus
February 12, 2009	Central Labrador Environmental Action Network; Grand River Keepers	Happy Valley-Goose Bay, NL	9	Presentation and discussion of the Project, environmental baseline studies and the EA process
February 13, 2009	Newfoundland and Labrador Environment Network; Canadian Parks and Wilderness Society; Northeast Avalon Atlantic Coastal Action Program, Natural History Society; Northeast Avalon Atlantic Coastal Action Program; Protected Areas Association; Newfoundland and Labrador Environmental Industry Association	St. John's, NL	7	Presentation and discussion of the Project, environmental baseline studies and the EA process
March 24, 2009	Newfoundland and Labrador Outfitters Association	St. John's, NL	3	Discussion of the Project, the EA process and potential issues
April 2, 2009	Hospitality Newfoundland and Labrador	Stephenville, NL	12	Presentation and discussion of the Project, environmental baseline studies, the EA process and potential issues
April 8, 2009	Fisheries Advisory Committee, Labrador Straits Development Corporation	L'Anse au Loup, NL	9	Presentation and discussion of the Project, environmental baseline studies, the EA process and potential issues
June 16, 2009	Discovery Regional Development Board and representatives from the Alpine Development Alliance Corporation and the Town of Clarenville	Clarenville, NL	4	Presentation and discussion of the Project, environmental baseline studies and the EA process, and a discussion of potential Project-related benefits and issues
June 16, 2009	Discovery Regional Development Board and representatives of the Towns of Sunnyside, Come By Chance and Arnold's Cove	Arnold's Cove, NL	4	Presentation and discussion of the Project, environmental baseline studies and the EA process, and a discussion of potential Project-related benefits and issues
June 17, 2009	Exploits Valley Economic Development Corporation and representatives from Human Resources Labour and Employment and the Town of Buchans	Grand Falls-Windsor, NL	7	Presentation and discussion of the Project, environmental baseline studies and the EA process, and a discussion of potential Project-related benefits and issues

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups (continued)

Date	Group(s)	Location	Number of Participants[(a)]	Purpose and Focus
June 17, 2009	Humber Economic Development Board and representatives of the White Bay South Development Association, Pollard's Point Local Service District, Towns of Howley and Reidville, Grand Lake Centre of Economic Development, and the Humber Economic Development Board	Deer Lake, NL	6	Presentation and discussion of the Project, environmental baseline studies and the EA process, and a discussion of potential Project-related benefits and issues
July 7, 2009	Labrador Straits Development Corporation; Towns of L'Anse au Loup, West St. Modeste, L'Anse au Clair; local fishers; Department of Fisheries and Aquaculture	Forteau, NL	9	Discussion of the Project and proposed geotechnical investigations for the Strait of Belle Isle
July 7, 2009	Nordic Economic Development Corporation; Limestone Barrens Habitat Stewardship Program; St. Anthony Basin Research Inc.; Newfoundland and Labrador Wildlife Federation	Flower's Cove, NL	5	Discussion of the Project and proposed geotechnical investigations for the Strait of Belle Isle
July 30, 2009	Town of Conception Bay South	Conception Bay, NL	1	Discussion of the proposed field work pertaining to potential electrode site
August 10, 2009	Town of Conception Bay South	Conception Bay, NL	2	Presentation of an overview of electrode requirements for the Project, and proposed field work
September 25, 2009	Labrador Straits Historical Development Corporation	Forteau, NL	1	Discussion regarding the potential cable landing sites and associated drilling on the Labrador side of the Strait of Belle Isle
September 30, 2009	Cartwright to L'Anse au Clair District Forum (Included participation by several government and private sector organizations)	West St. Modeste, NL	54	Presentation on the proposed Project and the Lower Churchill Hydroelectric Generation Project
October 6, 2009	Parsons Pond Outfitting	Parsons Pond, NL	1	Discussion of the proposed transmission corridor in the Long Range Mountains area and potential caribou and access issues

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups (continued)

Date	Group(s)	Location	Number of Participants[a]	Purpose and Focus
October 6, 2009	International Appalachian Trail Association	Corner Brook, NL	2	Discussion of the proposed transmission corridor in the Long Range Mountains area, and potential visual issues and interaction with the existing and proposed trails
October 13, 2009	Central Labrador Economic Development Board	Happy Valley-Goose Bay, NL	8	Presentation on the Project description, rationale and the EA, and discussion of potential Project-related benefits and issues
October 13, 2009	Town of Happy Valley-Goose Bay	Happy Valley-Goose Bay, NL	9	Presentation on the Project and discussion of potential Project-related benefits and issues
October 14, 2009	Mud Lake Improvement Committee	Mud Lake, NL	4	Project overview and discussion of questions and potential issues
October 14, 2009	Town of North West River	North West River, NL	6	Presentation on the Project description, rationale and the EA, and discussion of potential Project-related benefits and issues
October 15, 2009	Red Ochre Regional Economic Development Board	Deer Lake, NL	8	Presentation on the Project description, rationale and the EA, and discussion of potential Project-related benefits and issues
October 15, 2009	St. Paul's to Bellburns District Advisory Council	Parsons Pond, NL	10	Presentation on the Project description, rationale and the EA, and discussion of potential Project-related benefits and issues
October 20, 2009	Labrador Straits Development Corporation Fisheries Working Group; local fishers; Department of Fisheries and Aquaculture; Fish, Food and Allied Workers	L'Anse au Loup, NL	7	Presentation and discussion of the Project, and specifically the Strait of Belle Isle crossing and potential effects on fish and fisheries
October 22, 2009	Strait of Belle Isle fishers (Island Side): Fish, Food and Allied Workers	Flower's Cove, NL	6	Presentation and discussion of the Project, and specifically the Strait of Belle Isle crossing and potential effects on fish and fisheries
November 18, 2009	Various Northern Peninsula Hunting and Fishing Outfitters	Portland Creek, NL	10	Project overview, rationale for corridor selection through the Long Range Mountains, and discussion of potential effects on outfitters

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups (continued)

Date	Group(s)	Location	Number of Participants[(a)]	Purpose and Focus
January 19, 2010	International Appalachian Trail Association	Corner Brook, NL	2	Follow up discussion on transmission corridors (preferred and alternative) in the Long Range Mountains area, and potential visual issues and interaction with existing and proposed trails
January 24, 2010	Holyrood Community Liaison Committee	Holyrood, NL	6	Presentation and discussion of the Project, its EA, future of the Holyrood Thermal Generating Facility, and the 2007 Energy Plan
June 24, 2010	Labrador Straits Development Corporation	West St. Modeste, NL	12	Question and Answer session with the Labrador Straits Development Corporation
January 12, 2011	Town of Flower's Cove; Newfoundland and Labrador Rural Secretariat; Flower's Cove Harbour Authority; Sandy Cove Harbour Authority; Department of Innovation, Trade and Rural Development; Nordic Economic Development Corporation; Great Northern Peninsula Joint Council; Fish Food and Allied Workers	Flower's Cove, NL	8	Presentation and discussion of the Strait of Belle Isle cable crossing
January 13, 2011	Labrador Straits Development Corporation; Towns of L'Anse au Clair, West St. Modeste, Red Bay, Forteau, Capstan Island; Fish Food and Allied Workers; Neighbours Without Borders Coalition; Forteau Harbour Authority; Labrador Straits Historical Development Corporation; Riteway Construction Ltd.; Department of Fisheries and Aquaculture; Fisheries and Oceans Canada; Southern Labrador Development Association; local fishers	West St. Modeste, NL	15	Presentation and discussion of the Strait of Belle Isle cable crossing and the proposed shoreline electrode at L'Anse au Diable
February 7, 2011	Forteau Town Council	Forteau, NL	4	Project overview and discussion of infrastructure and economic considerations
February 7, 2011	Labrador Straits Development Corporation	West St. Modeste, NL	55	Presentation at Labrador Straits Development Corporation Annual General Meeting, overview of Project and associated construction activities and economic considerations

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups (continued)

Date	Group(s)	Location	Number of Participants[(a)]	Purpose and Focus
February 22, 2011	Town of Conception Bay South; Town of Holyrood; Fish Food and Allied Workers; Holyrood Thermal Generating Station; Newfoundland Power	Conception Bay South, NL	6	Presentation and discussion of the Project and the proposed shoreline electrode at Dowden's Point, Conception Bay South
March 7, 2011	Town of Conception Bay South (represented by Tract Consulting)	St. John's, NL	3	Discussion of the proposed shoreline electrode at Dowden's Point, and the Town of Conception Bay South proposed trail system
March 8, 2011	Newfoundland and Labrador Outfitters Association	Corner Brook, NL	1	Overview of the Project and EA process, and questions and concerns regarding outfitters
March 9, 2011	Labrador Professional Outfitters Association	Happy Valley-Goose Bay, NL	1	Overview of the Project and EA process, and questions and concerns regarding outfitters
March 31, 2011	Town of Forteau	Forteau, NL	6	Presentation and discussion of the Project and the planned 2011 engineering field program
April 1, 2011	Labrador Straits Historical Development Corporation	Forteau, NL	1	Presentation of Project overview and 2011 Strait of Belle Isle engineering field program
June 1, 2011	Fish Food and Allied Workers; Newfoundland and Labrador Rural Secretariat; Department of Innovation, Trade and Rural Development; Town of Flower's Cove; Great Northern Peninsula Joint Council; St. Anthony Cold Storage; St. Anthony and Area Chamber of Commerce; Nordic Economic Development Corporation	Flower's Cove, NL	8	An update on the Project and the 2011 Strait of Belle Isle engineering and environmental field programs
June 13, 2011	Labrador Straits Development Corporation	Forteau, NL	5	Overview of the EA process and its application to the Project
June 13, 2011	Labrador Straits Development Corporation; Labrador Adventures; Labrador Straits Historical Development Corporation; L'Anse au Loup Harbour Authority; Southern Labrador Development Association; Representative from the towns of Forteau, L'Anse au Loup, and Capstan Island; Forteau Harbour Authority	L'Anse au Loup, NL	12	An update on the Project and the 2011 Strait of Belle Isle engineering and environmental field programs

Table 8.3.1-1 Meetings with Communities, Organizations and Other Interest Groups (continued)

Date	Group(s)	Location	Number of Participants[a]	Purpose and Focus
October 13, 2011	Business community of Happy Valley-Goose Bay	Happy Valley-Goose Bay, NL	23	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers
October 17, 2011	Business community of St. Johns	St. Johns, NL	>200	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers
October 18, 2011	Business community of Grand Falls-Windsor	Grand Falls-Windsor, NL	11	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers
October 21, 2011	Business community of Corner Brook	Corner Brook, NL	24	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers
October 26, 2011	Business community of Flower’s Cove	Flower’s Cove, NL	34	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers
October 27, 2011	Business community of L’Anse au Loup	L’Anse au Loup, NL	19	To provide information on business opportunities generated from the Labrador-Island Transmission Project to the suppliers

[a] Does not include Nalcor participants.

8.3.2 Public Meetings and Open Houses

Nalcor has held a total of 29 public open house sessions related to the Project throughout Newfoundland and Labrador in 2010 and 2011, 12 of which were specific to the Labrador-Island Transmission Link, as well as 17 additional and general sessions that included information and discussion related to both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project.

8.3.2.1 Labrador-Island Transmission Link EA Open Houses – April and May 2010

In April and May 2010, Nalcor held eight open house sessions specific to the Project throughout Newfoundland and Labrador. The purpose of these sessions was to present the Project concept to the public and identify any issues and concerns to be addressed in the EIS. LEK was also captured from participants through verbal and written comments and is incorporated in the EIS, specifically Chapter 10.

This section summarizes the locations of each of these open houses, including date and time, and the number of participants (Table 8.3.2-1). Information on public notifications, open house format, and display material, are also presented. Issues and concerns that were identified during these open houses are included in Section 8.4.

Table 8.3.2-1 EA Open Houses held in April and May 2010

Town	Venue	Date	Time	Number of Participants[(a)]
Clarenville	Clarenville Inn	April 26	4 to 9 pm	10
Grand Falls-Windsor	Royal Canadian Legion	April 27	4 to 9 pm	17
Deer Lake	Deer Lake Motel	April 28	4 to 9 pm	35
Hawke’s Bay	Torrent River Inn	April 29	4 to 9 pm	17
Flower’s Cove	Lions Club	April 30	4 to 9 pm	30
L’Anse au Loup	Lawrence O’Brien Community Centre	May 1	1 to 6 pm	22
St. John’s	Holiday Inn	May 10	4 to 9 pm	59
Happy Valley-Goose Bay	Labrador Friendship Centre	May 11	4 to 9 pm	49

(a) Does not include Nalcor participants.

Public Notification

Prior to the public open house sessions, public notification activities included newspaper advertisements (Table 8.3.2-2), public notices, and invitations, as listed below.

Table 8.3.2-2 Newspaper Advertisements for EA Open Houses held in April and May 2010

Newspaper	Insertion Dates
The Western Star	Saturday April 10, 17, 24
The Telegram	Saturday April 10, 17, 24 and May 1, 8
The Compass – Weekly	April 12-16, April 19 to 23, April 26-30
The Advertiser – Weekly	April 12-16, April 19 to 23, April 26 to 30
The Northern Pen – Weekly	April 12-16, April 19 to 23, April 26 to 30
The Packet – Weekly	April 12-16, April 19 to 23, April 26 to 30
The Labradorian – Weekly	April 12-16, April 19 to 23, April 26 to 30, May 3 to 7

Notices were also sent directly to the following communities and organizations:

- Northeast Avalon Regional Economic Development Board;
- Discovery Regional Development Board;
- Exploits Valley Regional Economic Development Board;
- Humber Regional Economic Development Board;
- RED Ochre Regional Board Inc.;
- Nordic Regional Economic Development Board;
- Labrador Straits Development Corporation;
- Central Labrador Economic Development Board;
- City of St. John's;
- Town of Clarenville;
- Town of Grand Falls-Windsor;
- Town of Deer Lake;
- Town of Hawke's Bay;
- Town of Flower's Cove;
- Town of L'Anse au Loup; and
- Town of Happy Valley-Goose Bay.

Advertisements were also aired province wide on Roger's TV, in partnership with Eastlink, from April 19 to April 25, and Clearview Cable from April 19 to May 2.

A public notice was posted on the Nalcor website at www.nalcorenergy.com and notification of the open houses was sent to all Nalcor employees via email as well as posted on Nalcor's intranet.

Invitations were sent to the mayor of each open house community.

The public notification campaign and open houses resulted in the following media coverage:

- The Western Star published an article "People have the Power" on April 27, 2010. The article was also published in the Nor'Wester on April 29.
- President and Chief Executive Officer, Ed Martin, was interviewed on West Coast Morning-2 (CBY-AM) Corner Brook on April 28, 2010.
- Gilbert Bennett, Vice President - Lower Churchill Project, was interviewed by the Western Star in Deer Lake on April 28, 2010. The article, "Lower Churchill explained at open house" was published in the Western Star on April 29, the Telegram on April 29, and the Georgian on April 30.
- Vice President Gilbert Bennett was interviewed by the Northern Pen. The article, "Nalcor prefers face-to-face approach" was published on May 5, 2010.
- VOCM-AM, St. John's aired an article "Nalcor to host final open house today" on May 11, 2010.
- General public announcements were aired on VOCM throughout the week of April 25 to May 1, 2010.

Open House Format

The format for the open houses was a series of informal drop-in sessions with display stations and take away information sheets. Members of the Project team were available to answer questions, explain the various components of the Project and to receive and record feedback and LEK from the public.

Upon arrival, participants were welcomed by a Nalcor representative who provided an overview of the open house format. There were a total of five information stations, a sign-in table, feedback table, and refreshment table. At least one Project member was located at each station to answer questions and gather feedback from participants. Before leaving, participants were encouraged to fill out a feedback form.

The five information stations were as follows:

- Station one provided a corporate overview of Nalcor and included information about its five lines of business, vision, values and goals. Take-away material included a corporate brochure.
- Station two provided information about the Project purpose and rationale, and employment opportunities. Take-away material included a Project brochure and employment and business opportunities information sheet.
- Station three provided information about Project elements, including converter stations and electrodes, transmission lines, and the Strait of Belle Isle cable crossing. Take-away material included information sheets on electrodes, electromagnetic fields, (EMFs) and an explanation of the transmission study corridor versus eventual transmission route (right-of-way (ROW)).
- Station four provided information about the EA process and the current stage of the Project's review, and the various environmental studies conducted for the Project. Take-away material included information sheets on the EA process and environmental studies.
- Station five displayed large Project maps outlining the Project corridor, and detailed regional topographic map showing the segment of the transmission corridor relevant to each open house community and surrounding area. Smaller versions of the maps were available for participants to take with them.

Participation and Feedback

A total of 239 members of the public participated in the eight 2010 open houses. In addition to numerous verbal comments that were received and recorded by team members, 154 feedback forms were completed. Overall, 90 percent (%) (or greater) of participants agreed or strongly agreed with the following statements: 1) sufficient information was provided; 2) information was relevant; 3) information was easy to understand; 4) Project team members were able to address my questions; and 5) open house format was effective. Issues and concerns identified by participants were recorded and compiled, and are summarized in Section 8.4, and Local Ecological Knowledge is summarized in Chapter 10.

8.3.2.2 Additional Labrador – Island Transmission Link EA Open Houses in 2011

In June and September of 2011, Nalcor held four additional Project-specific public open house sessions in the communities of North West River, Forteau, Sandy Cove, and Conception Bay South. Despite having held open houses in various nearby communities in 2010 and 2011 (Sections 8.3.2.1 and 8.3.2.3), these sessions were added by Nalcor to address the specific requirements from the May 2011 EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011b) to hold open houses in these communities.

This section summarizes the location of each of these open houses, including date and time, and the number of participants (Table 8.3.2-3). Information on public notifications, open house format, and display material are also presented. Issues and concerns that were identified during these open houses are included in Section 8.4.

Table 8.3.2-3 Additional Labrador – Island Transmission Link EA Open Houses in 2011

Location	Venue	Date	Time	Number of Participants
North West River	Labrador Interpretation Centre	June 29	6 to 8 pm	0
Sandy Cove	Sandy Cove Lions Centre	September 13	4 to 7 pm	34
Forteau	John A. Dumeresque Town Centre	September 14	4 to 7 pm	19
Conception Bay South	Worsley Park	September 29	4 to 7 pm	13

Public Notification

Prior to the open house, public notification activities included newspaper advertisements (Table 8.3.2-4) and public notices as listed below.

Table 8.3.2-4 Newspaper Advertisements for Additional Labrador – Island Transmission Link EA Open Houses in 2011

Newspaper	Insertion Dates
The Labradorian	June 20 and June 27
Northern Pen	August 29, September 5 and 12
The Telegram	Sept 10, 17 and 24

Notices were also sent directly to the following communities and organizations:

- Town of North West River;
- Nordic Regional Economic Development Corporation;
- Public bulletin boards of Sandy Cove;
- Labrador Straits Economic Development Corporation;
- Town of Forteau; and
- Town of Conception Bay South.

The public notification campaign and open houses resulted in the following media coverage:

- Northern Pen, September 19, 2011 – Lower Churchill Project talks transmission.

Open House Format

Similar to the format of the 2010 sessions, there were a total of five information stations, a sign-in table, feedback table, and refreshment table.

Participation and Feedback

A total of 66 members of the public participated in the four additional Labrador – Island Transmission Link EA open houses in 2011. In addition to numerous verbal comments that were received and recorded by team members, 36 feedback forms were completed. Overall, 90% or greater of participants agreed with the following statements: 1) sufficient information was provided; 2) information was relevant; 3) information was easy to understand; 4) Project team members were able to address my questions; and 5) open house format was effective. Issues and concerns identified by participants were recorded and compiled, and are summarized in Section 8.4, and LEK is summarized in Chapter 10.

8.3.2.3 Nalcor Open Houses April to September 2011

In addition to the above, 17 open houses were held across Newfoundland and Labrador between April and June 2011 by Nalcor. To cover a broad range of Nalcor's proposed development activities and interests, while at the same time maximizing efficiency, these sessions included information and discussion related to both the Project and the Lower Churchill Hydroelectric Generation Project.

This section summarizes the locations, date and time of each of these open houses, and the number of participants (Table 8.3.2-5). Information on public notifications, open house format, and display material, are also presented. Issues and concerns related to the Project that were identified during these open houses are included in Section 8.4.

Two of these open houses were held in Labrador Aboriginal communities, Hopedale and Sheshatshiu. These are included in the summary tables, but are discussed further in Chapter 7 (Aboriginal Consultation and Issues Scoping). The issues, concerns and LEK identified at these two sessions are also presented within that chapter.

Table 8.3.2-5 Nalcor Open Houses held from April to June 2011

Location	Venue	Date	Time	Number of Participants[a]
St. John's	Capital Hotel	April 18	3 to 8 pm	45
Holyrood	Star of the Sea	April 20	3 to 8 pm	28
Marystown	Marystown Hotel	April 25	3 to 8 pm	12
Gander	Hotel Gander	April 26	3 to 8 pm	13
Bay d'Espoir	Milltown Lions Club	April 27	3 to 8 pm	13
Corner Brook	Greenwood Inn	April 28	4 to 9 pm	26
St. Anthony	St. Anthony Lions Centre	May 16	3 to 8 pm	9
West St. Modeste	Oceanview Resort	May 17	3 to 8 pm	10
Happy Valley-Goose Bay	Hotel North 2	May 18	3 to 8 pm	17
Labrador City	Two Seasons Inn	May 19	3 to 8 pm.	5
Stephenville	Holiday Inn	May 24	4 to 9 pm	2
Port aux Basques	St. Christopher's Hotel	May 25	3 to 8 pm	8
Grand Falls-Windsor	Royal Canadian Legion	May 26	4 to 9 pm	10
Hopedale	Amos Comenius Memorial School	May 31	4 to 8 pm	29
Cartwright	Cartwright Hotel	June 1	4 to 7:30 pm	15
Sheshatshiu	Sheshatshiu Innu School	June 2	4 to 8 pm	13
Churchill Falls	Churchill Falls Community Centre	June 9	3 to 8 pm	18

[a] Does not include Nalcor participants.

Public Notification

Prior to the public open house sessions, public notification activities included newspaper advertisements (Table 8.3.2-6), public notices, and invitations, as listed.

Table 8.3.2-6 Newspaper Advertisements for Nalcor Open Houses held in April to September 2011

Newspaper	Insertion Dates
The Western Star	April 23, 25 and 27
The Telegram	April 16 and 18
The Coaster – Weekly	April 19 and 26
The Gulf News – Weekly	April 9, 16, 23 and 25
The Shoreline – Weekly	April 15
The Southern Gazette – Weekly	April 19
The Beacon – Weekly	April 21
The Advertiser – Weekly	May 9, 16 and 23
The Northern Pen – Weekly	May 2, 9, 16, 23 and 30
The Labradorian – Weekly	May 2, 9, 16, 23 and 30
The Aurora – Weekly	May 2, 9 and 16
The Georgian – Weekly	May 9, 16 and 23

- Radio advertisements on VOCM (am) between April 14 and 20 (three to five times per day).
- Public notices were emailed to the Regional Economic Development Boards, Municipalities, NL and Chambers of Commerce.
- A public notice was aired on the CET Network in Happy Valley-Goose Bay.
- A public notice was advertised on nalcorenergy.com. Notification of the open houses was sent to all Nalcor employees via email and posted on Nalcor's intranet.
- A press release was issued by Nalcor on April 14, 2011 and posted on the Nalcor website, and emailed to all media and provincial stakeholders on Nalcor's distribution list.
- The open houses public notification campaign resulted in the following media coverage:
  - April 18, 2011, CBC Gander - Lower Churchill;
  - April 19, 2011, Southern Gazette - open houses on Lower Churchill Project;
  - April 26, 2011, NTV News - Nalcor conducting information sessions;
  - April 29, 2011, The Telegram - Economy, environment discussed at Nalcor forum;
  - April 29, 2011, The Western Star - Economy verses environment;
  - May 3, 2011, Southern Gazette - Nalcor tour for Lower Churchill Project stops in Marystown;
  - May 9, 2011, Northern Pen - open house on Lower Churchill; and
  - May 10, 2011, The Coaster - Nalcor officials talk about Lower Churchill.

Open House Format

Upon arrival, participants were welcomed by a Lower Churchill Project member who provided an overview of the open house session. There were a total of six information stations, a sign-in table, feedback table, and refreshment table. At least one Nalcor representative was present at each station to answer questions and gather feedback and LEK from participants. Before leaving, participants were encouraged to fill out a feedback form.

The six information stations were as follows:

- Station one provided a corporate overview of Nalcor and included information about its five lines of business, vision, values and goals. Take-away material included a corporate brochure.
- Station two provided information about the proposed Project and the Lower Churchill Hydroelectric Generation Project. Take-away material included maps and fact sheets on the projects, including employment and business opportunities.
- Station three provided information about the EA processes and the individual EA reviews for the two projects. Take-away material included information sheets on the EA process and environmental studies.
- Station four provided information about potential employment and business opportunities.
- Station five provided fact sheets on the Holyrood Thermal Generating Station, electricity rates and demand, and a Nalcor video.
- Station six included models of the projects and their associated components.

Participation and Feedback

A total of 273 members of the public participated in the 17 open houses. In addition to numerous verbal comments that were recorded by team members, 128 feedback forms were completed.

Overall, 90% (or greater) of participants agreed or strongly agreed with the following statements: 1) sufficient information was provided; 2) information was relevant; 3) information was easy to understand; 4) Project team members were able to address my questions; and 5) open house format was effective.

Questions and issues identified by participants were recorded and compiled and are presented in Section 8.4 and LEK is summarized in Chapter 10.

8.3.2.4 Nalcor Supplier Information Sessions

In October 2011, six supplier information sessions were held across Newfoundland and Labrador. The purpose of the sessions were to inform the business community of avenues to get involved in both the Project and the Lower Churchill Hydroelectric Generation Project, how to navigate through the procurement process and learn about the products and services to be procured.

This section summarizes the public notification, format, and attendance.

Table 8.3.2-7 Nalcor Supplier Information Sessions 2011

Town	Venue	Date	Time	Number of Participants	Number of One-on-One meetings
Happy Valley-Goose Bay	Royal Canadian Legion	October 13, 2011	9 am to 4 pm	23	26
St. John's	Sheraton Hotel	October 17, 2011	9 am to 5 pm	~200	105
Grand Falls-Windsor	Royal Canadian Legion	October 18, 2011	9 am to 1 pm	10	8
Corner Brook	Pepsi Centre	October 21, 2011	9 am to 1 pm	23	11
Flower's Cove	Flower's Cove Lions Club	October 26, 2011	2 pm to 6 pm	32	13
L'Anse au Loup	Lawrence O'Brien Community Centre	October 27, 2011	2 pm to 6 pm	19	11

Public Notification

Prior to the information sessions, numerous public notification activities were carried out in order to solicit as much involvement from the business community as possible.

Nalcor partnered with the following organizations to help disseminate the public notice and increase awareness:

- St. John's Board of Trade;
- Newfoundland and Labrador Regional Economic Development Associations;
- Labrador North Chamber of Commerce;
- St. Anthony and Area Chamber of Commerce;
- Exploits Regional Chamber of Commerce;
- Corner Brook Board of Trade;
- City of Corner Brook;
- Town of Grand Falls-Windsor;
- Town of Happy Valley-Goose Bay;
- Town of Flower's Cove;
- Town of L'Anse au Clair;
- Town of L'Anse au Loup;
- Town of Forteau;
- Town of West St. Modeste;
- Town of Red Bay;
- Town of Pinware;
- Combined Councils of Labrador;
- Great Northern Peninsula Joint Council;
- Department of Innovation, Trade and Rural Development;
- Department of Business;
- Newfoundland and Labrador Oil and Gas Industries Association (NOIA);
- Newfoundland and Labrador Environmental Industry Association (NEIA);
- Newfoundland and Labrador Business Collation;
- Innu Business Development Centre;
- Labrador Inuit Development Corporation;
- Nunacor (formally the Metis Development Corporation);
- Newfoundland Aboriginal Women's Network;
- Newfoundland and Labrador Organization of Women Entrepreneurs (NLOWE);
- Business Development Bank of Canada;

- Community Business Development Corporation; and
- Rural Secretariat.

Prior to the supplier development sessions, newspaper advertisements were listed in several newspapers as presented in Table 8.3.2-8.

Table 8.3.2-8 Newspaper Advertisements for Nalcor Supplier Information Sessions in 2011

Newspaper	Insertion Dates
The Telegram	October 5, 8, and 15
The Western Star	October 5, 8, and 15
The Labradorian	October 3 and 10
The Advertiser	October 3, 10, and 17
The Northern Pen	October 10, 17, and 24

The public notice was also posted on the CET Network in Happy Valley-Goose Bay, on nalcorenergy.com and Nalcor's Facebook page. A blog was also written about the sessions.

The public notification campaign resulted in the following media coverage:

- October 21, 2011, The Western Star – Businesses can learn about opportunities with lower Churchill project;
- October 22, 2011, The Western Star – Nalcor session an eye-opener for small businesses;
- October 23, 2011, CBN-AM – Muskrat Falls Development good for local business; and
- October 31, 2011, Northern Pen – Nalcor talks opportunity.

Supplier Information Session Format

The sessions began with a Project and Lower Churchill Hydroelectric Generation Project overview/update followed by a presentation on the procurement process including a description of goods and services, procurement forecast and opportunities for small businesses. Direction was provided on where and how contractors and sub-contractors can get up to date information on the status of bids and contact information for successful bidders.

Following the presentations, members of Nalcor's and SNC Lavalin's procurement teams were available for a 15 minute one-on-one meeting with anyone that wanted to discuss their business or joint venture partnerships privately.

8.4 Questions and Issues Identified

A summary of the key Project-related questions and issues raised through the regulatory, public and stakeholder consultation activities described above is provided in Table 8.4-1, categorized by theme. The table also indicates where each item is addressed in this EIS.

Table 8.4-1 Questions and Issues Raised in Consultations

Question / Issue Raised	EIS Section(s)
Project Rationale and Planning	
Perception that transmitting power to the Island not benefiting the entire province	2.1, 16.4.5.1
Other energy alternatives should be explored	2.5, 2.6
Concern that the Project may result in electricity rates increasing in all parts of the province	2.1, 2.8
Would like to get cheaper energy	2.1, 2.8
Questions why the transmission link does not have the capacity to carry Gull Island power	2.5.13.3
Power availability for future industrial development in Labrador	NIS[a]
Project Description	
How maintenance will be performed in challenging areas of the Project (e.g., Long Range Mountains)	3.5.2, 4.1.4.2
Technical challenges associated with the Strait of Belle Isle crossing	3.1.7.2, 3.1.8.2, 3.3.2.2, 4.1.6.2, 4.1.9.2, 4.2.2.2
Approximately 4 inch diameter rocks being proposed to construct the rock berms, may not be sufficient to fully protect the cables	3.4.3.3
Rock placement vessel may not be able to dock on the Labrador side of the Strait of Belle Isle	NIS[a]
Rock placement vessel and a cable laying vessel having difficulty manoeuvring due to the strong tides and currents in the Strait of Belle Isle	4.1.7.2
Suggestions and Alternatives	
Potential to construct multiple converter stations along the transmission line	2.12.2
Straighter corridor crossing of the Strait of Belle Isle as it may be easier to navigate around	2.12.4
Potential passenger tunnel for the Strait of Belle Isle crossing	NIS[a]
Pre-investing in the cables and transmission system that could accommodate Gull Island and Muskrat Falls power	2.1, 2.5.13.3 / NIS[a]
Transmission line should follow existing transmission lines wherever possible	3.3.4.2, 3.4.2.1, Appendix 3-2
Transmission line should follow Phases 2 and 3 of the Trans-Labrador Highway	2.11.2, 3.2, 3.3.2.1
Transmission line should be moved more north between Grand Falls and Gander[b]	2.11.2
Suggestion for the Labrador transmission corridor be routed directly south across the Québec border thereby avoiding challenging terrain[b]	2.11.2
Transmission line should make a more direct crossing of the Long Range Mountains toward the Cat Arm hydro development and then follow the eastern coast of the Northern Peninsula[b]	2.11.2
The north side of Conception Bay may be a better location for the Newfoundland electrode[b]	2.11.2
Can the power be converted to alternating current (ac) on the Newfoundland side of the Strait of Belle Isle, and added to the Island grid at this location rather than brought another 700 kilometres (km) to Soldiers Pond	NIS[a]

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
EA Process and Consultation	
Stakeholder groups do not have the funding to actively participate in the EA process	NIS[(a)]
Duration of the EA process	1.3, NIS[(a)]
Technical material presented is often too complex for the general public to understand	8.3.2 and Plain Language Summary
Regardless of whether Nalcor is reducing or mitigating the effects, there are still effects on the environment	Chapter 11, 12, 13, 14 and 16
The ability to accurately and confidently predict the potential effects, and what the consequence will be if the assumptions are incorrect	Chapter 9, 11, 12, 13, 14, and 16
Aquatic Environment	
Adjacency of the corridor to spawning habitat and fish stocks and the effect of construction and long-term maintenance activities on the aquatic environment, specifically access roads, trails and tower construction	13.3.5.3, 13.3.5.4, 13.3.6.3
The transmission of a large amount of power over these aquatic environments and the potential effects on fish	3.5.3.1
The use of herbicides to suppress vegetative growth may affect aquatic environments, which may result from drift from aerial spraying extending beyond the extent of the ROW boundaries	13.2.6.3, 13.3.6.3, 13.4.1
Increased access, specifically bridges previously removed (to regulate access to aquatic resources) will be re-established	3.4.6, 13.3.5.4
Water quality for the Portland Creek, Inner Pond area, due to the use of herbicides	3.5.2.3, 13.2.6.3, 13.4.1, Appendix 3-1, Table 3-1.1
Increased access, specifically workers having access to remote fish stocks during the Construction Phase	13.4.1
Terrestrial Environment	
Vegetation	
Protection of the Limestone Barrens and Nalcor's mitigation plan for rare plants	12.2.5.6
Timber	
Productive forest areas and land being taken out of commission permanently	12.2.5.8
Removal of timber and amount to be harvested	12.2.5.8
Removal of "new growth" during clearing activities	12.2.5.8
Vegetation	
Increased access for recreational vehicles into interior areas of the province and the effect on wetlands and the potential of introducing invasive species	12.2.5
Transmission line passing through the Main River watershed may compromise some of the last remaining old growth forests in the province	12.2.5.3
Rare plants on the Northern Peninsula	12.2.5.6, 12.2.5.7, 12.2.6.5

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
Parks / Protected Areas / Ecosystems	
Concern over the following areas: Canadian Heritage River (Main River) watershed, Butterpot Provincial Park, Jack's Pond Provincial Park, Hawke Hills Ecological Reserve, Pinware Provincial Park, West Brook Ecological Reserve, the proposed Mealy Mountains National Reserve, and the Long Range Mountains (and specifically the Portland Creek area), and the Humber River watershed	16.5.5.6, 16.5.6.5, 16.8.7, 16.8.8
Potential displacement of ecosystems as a result of clearing for ROWs and the construction of concrete and steel structures within these ecosystems	12.2.5.3, 12.5.6.5, 17.6.1.2
The effect the Project may have on the ecological integrity of nearby protected areas (i.e., Main River Park, Gros Morne National Park)	16.5.5.6, 16.5.6.5, 17.6.1
Wildlife	
Potential effect of clearing the ROW, the use of chemical defoliants, and access roads on wildlife	12.3.5, 12.3.6, 12.3.7, 12.4.5, 12.4.7, 12.5.5, 12.5.6, 12.5.7, 12.4.6, 12.4.6.1
Habitat loss or degradation and potential harassment of wildlife	12.3, 12.4, 12.5
Increased harvesting of wildlife resulting from the increased accessibility	12.3, 12.4, 12.5
Herbicide use during maintenance activities on the ROW and the effect on wildlife, including their water supplies	12.3.6.3, 12.3.7, 12.4.6.3, 12.4.7, 12.5.6, 12.5.7, 13.2.6.3
Effect on woodland caribou, specifically: habitat fragmentation potential effect of changes in migratory routes; potential use of the ROWs by predators (e.g., wolves, coyotes, bears); construction in the vicinity of breeding and caribou calving grounds; access (increased disturbance from snowmobiles and recreational vehicle usage in previously inaccessible areas; potential habitat disturbance or fragmentation from increased domestic cutting)	12.3.5, 12.3.6, 12.3.7
Suggestion that construction take place later in the fall to reduce interaction with calving	12.3.5.1
The potential effects of EMFs on wildlife	3.5.3.1
Transmission line being constructed through pine marten habitat resulting in further habitat loss and increased disturbance by humans	12.4.5.3, 12.4.6.3, 12.4.7
Avifauna	
Effect of the transmission lines and towers on migratory birds	12.5.6, 12.5.7
Concerned that increased access could result in an increase in harvesting of endangered birds and in human disturbance in the form of recreational vehicle usage resulting in breeding area destruction or degradation	12.5.6, 12.5.7
Atmospheric Environment	
Air emissions associated with the Project and the effect of these emissions	11.2.5, 11.2.6, 11.2.7
EMFs and audible noise from the transmission lines	11.2.6, 11.2.7, 16.3.6.5, 16.3.6.2, 16.3.6.6

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
Replacement of the energy produced at the Holyrood Thermal Generating Station with a renewable energy source will greatly benefit the residents of Conception Bay South	2.5.8, 2.5.9, 2.5.10, 2.5.11, 3.4.3.5
Potential interference from the Project on satellite television, radio and cellular use	16.3.6.6
Marine Environment – Electrodes	
Potential effect on marine life, including the fishery, and humans during normal operations and during a system malfunction	3.5.3.2, 14.2.6.5, 14.2.74
Marine Environment - Strait of Belle Isle Cable Crossing	
Submarine cable emissions affecting marine life (fish, marine mammals, sea turtles) and the fishery	14.2.6.5, 14.2.7, 14.3.6, 14.3.7
Species at risk being affected	14.5.2
The short- and long-term effects of construction on pelagic and groundfish species, marine mammals, sea turtles, and mollusks and crustaceans, and the cumulative effects of the construction and the long-term placement of cables on the ocean floor	14.2.5, 14.2.7, 14.2.8, 14.3.5, 14.3.7, 14.3.8
Effect of dredging, drilling, blasting and other activities on and through the sea bed	14.2.5, 14.2.7, 14.2.8, 14.3.5, 14.3.7, 14.3.8
In-water construction during the migration of pelagic and groundfish species may affect migration, specifically the species sensitive to noise and other disturbance (e.g., capelin, herring)	14.2.5.4, 14.2.7
Effect of “electrical wires” on the sea floor on benthic species	14.2.6, 14.2.7
Construction could affect salmon migration as the crossing is near a major salmon river	4.2.7, 14.2.6.5
Potential fishing restrictions near the cable crossings, specifically whether otter trawls and scallop dredges will be permitted in the vicinity of the cable crossings.	16.5.5.3
Timing and duration of construction; if the construction occurs between May and October it will coincide with the opening and closing dates of the commercial fishery.	3.4.1, 16.6.5.3, 16.6.7, Figure 3.4.1-1
Concern the 4 inch diameter rocks proposed for rock berm construction will not be sufficient to protect the cables from fishing activity	3.4.3.3
The potential effect on scallops, and the recently re-opened refugium	14.2.5.4, 14.2.6.5, 14.2.7
Potential effects on the livelihoods of people dependent on fisheries resources, including harvesters and processors	16.6.7
Concern about the Maritime Link and the cumulative effects on marine fish, marine mammals and sea turtles	14.2.8, 14.3.8
Due to the region’s lack of a large, diverse employment base, future employment levels would be affected if the Project harms the area’s fisheries resources	16.6.7
Whether compensation will be provided if there is an effect on the commercial fishery	16.6.5, 16.6.5.3, 16.6.6.1, 16.6.6.3, 16.6.7.2
Effect of noise from the Horizontal Directional Drill (HDD) operation on fish stocks	14.2.5.4, 14.2.7
Increased sedimentation released into the water column during rock berm depositing	14.2.5, 14.2.7

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
Socioeconomic Environment	
Employment and Business	
Interest in opportunities for employment during the Construction Phase, and the Operations and Maintenance Phase	16.4.5, 16.4.6, 16.4.7
Number, classifications, and duration of jobs, and that most jobs will be short-term	16.4.5, 16.4.6, 16.4.7
Hiring of local workers and contractors and whether there will be an adjacency policy	16.4.5, 16.4.6, 16.4.7
Training and employment opportunities for non-Aboriginal persons	16.4.5, 16.4.6, 16.4.7
Equal representation of women in the Project workforce	16.4.5, 16.4.6, 16.4.7
Training requirements and timelines	16.4.5, 16.4.6, 16.4.7
Whether there are enough qualified people in the province to meet the job demand	16.4.5, 16.4.6, 16.4.7
Whether all jobs will be union contracts	16.4.5, 16.4.6, 16.4.7
Concern that only people who reside in the general vicinity of the Project will be employed	16.4.5, 16.4.6, 16.4.7
Interest in the potential for educational outreach programs for local youth on employment opportunities associated with the Project	16.4.5, 16.4.6, 16.4.7
Possible job loss at the Holyrood Thermal Generating Station	16.4.1
Whether procurement contracts may be awarded to local businesses. Potential for small, local businesses to compete with large global businesses for Project contracts	16.4.5, 16.4.6, 16.4.7
Lack of a port facility in region may limit ability of local businesses to supply rock for rock berm construction	11.2.5.5, 16.3.5.3
Waste management requirements and opportunities	16.3.5.4
Having workers use local accommodations, specifically during the off-season	3.4.2.3. 16.3.5.1, 16.7.5.1
Outfitters	
Potential effects of access, specifically the transmission line and access roads and trails providing access to local hunters, especially via snowmobiles. This may affect caribou and moose wintering areas as a result of increased activity.	12.3, 12.4, 12.5, 16.5.5.3, 16.5.6.3, 16.5.7
Property could be destroyed or stolen due to increased access to remote areas	16.5.5.3, 16.5.6.3, 16.5.7
Ensure that not only the footprint of the Project is assessed, as the potentially affected area for outfitters may be much larger, especially with respect to big game	12.3.2, 12.4.2
Viewscape effects, increased noise level increase during and after construction; degraded wilderness perception of remoteness; degraded product offering resulting in revenue loss for the business also resulting in loss of employment	16.5.5.3, 16.5.6.3

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
Viewscapes	
Concern over the visibility and visual aesthetic of the transmission system and associated infrastructure from various key locations: – Exploits River transmission line crossing and its location on the south side of the river – Humber River transmission line crossing – Trans-Canada Highway in Central and Eastern Newfoundland and the other highways on the Northern Peninsula – Birchy Lake area – Existing and proposed trails of the International Appalachian Trail Newfoundland and Labrador (IATNL) particularly the trails in the Portland Creek / Inner Pond area – Canadian Heritage River (Main River) – Infrastructure in the vicinity of the cable landing sites (e.g., transition compound, remnants from the HDD activities)	16.8
Communities	
Potential effects on water supplies located in the vicinity of the Project	13.2.6.3, 13.4.1, 16.3.6.1, 16.3.6.5, 16.5.5.3
Effect on the waste management systems in various regions of the province, including through the disposal of HDD tailings, and potential requirement for additional disposal sites	3.4.3.3, 16.3.5.4, 16.3.7
Increased use of ports, roads, landfills, water and sewer and other municipal services in Happy Valley-Goose Bay	16.3.5.3, 16.3.7
EMFs and audible noise from transmission lines and perceived health issues, especially near communities	16.3.6.5, 16.3.6.6
Land and Resource Use	
Potential benefit for increased all-terrain vehicle (ATV) and snowmobiling activity from the development of transmission lines	16.5.5.4, 16.5.6.3, 16.5.7
Potential overlap with municipal and planning boundaries	16.5.5.3, 16.5.6.3, 16.5.7
Proximity of transmission lines to walking and snowmobile trails on the Northern Peninsula (specifically in the Ten Mile Pond area)	16.5.5.4, 16.5.6.3, 16.5.7
Potential land expropriation process	16.5.5.1
Height of conductors across navigable waterways and potential interference with vessels	3.4.2.2, 16.5.5.4
Potential effects on fishing, hunting and cabin use in the Portland Creek area	16.5.5.4, 16.5.6.3
Whether construction infrastructure (e.g., bridges) would remain during project operations, which could have a potential positive benefit to local cabin and resource use	3.4.6.2, 16.5.6.3
Cottage areas of Cormack and Jack's Ladder need to be considered	16.5.5.4, 16.5.6.3
Restrictions on land use near the transmission lines, specifically near the cable landing points	3.3.2.2, 3.3.2.3
Proximity of transmission lines to ski resorts	16.7.5.4
Potential effect on berry picking due to herbicide use	16.3.6.5

Table 8.4-1 Questions and Issues Raised in Consultations (continued)

Question / Issue Raised	EIS Section(s)
Potential effect on traditional fishing, hunting and trapping activities by Aboriginal and non-Aboriginal groups as a result of increased access to the southern interior of Labrador	16.5.5.4, 16.5.6.3, 16.5.7
Proximity of the transmission line to an existing float plane base in the Labrador Straits, and potential effects on its operations	16.5.5.3
Transmission line passing through heavy cabin country on the Northern Peninsula	16.5.5, 16.5.6.3.4
Archaeology	
Potential for Maritime Archaic Indian artifacts near L'Anse Amour to be affected	16.2.5.1
Strait of Belle Isle crossing may affect the "Jersey Rooms" off Forteau Point and / or the fossil reefs near Point Amour	16.2.5.1
Tourism	
Concern the lighthouse in L'Anse Amour and associated tourism activity will be affected	16.2.1, 16.2.5.1
Potential damage to the T'Railway and associated infrastructure as a result of electrode construction in the Town of Conception Bay South	16.5.5.6
Visual and aesthetic effects of the Project on the tourism industry	16.7.5.3, 16.7.6.3, 16.8
Proposed and existing trails of the IATNL and the effect on the tourism industry in the area	16.5.5.4, 16.5.6.3, 16.7.7
Proximity of the transmission line to the Pioneer Footpath along the Labrador Straits	16.5.5, 16.5.6
Interest in local accommodations being used during the off-season	3.4.2.3, 16.3.5.1, 16.7.5.1
Wildlife Management	
Enforcement of wildlife regulations over the long-term throughout the life of the Project	NIS[a]
Increased access to wildlife prior to the implementation of an adequate wildlife management plan	12.3.5, 122.3.6, 12.3.7

(a) NIS – Not in scope. Consideration of the issue is outside the Project scope.

(b) EIS may not reference the location directly, but provides rationale for route selection.

8.5 References

Government of Newfoundland and Labrador and Government of Canada. 2011a. Environmental Impact Statement Draft Guidelines and Scoping Document, Labrador-Island Transmission Link. Prepared for Nalcor Energy. St. John's, NL.

Government of Newfoundland and Labrador and Government of Canada. 2011b. Environmental Impact Statement Guidelines and Scoping Document, Labrador-Island Transmission Link. Prepared for Nalcor Energy. St. John's, NL.

APPENDIX 8-1

TABLE OF CONCORDANCE WITH EIS GUIDELINES AND SCOPING DOCUMENT

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
Section 2 – Guiding Principles				
2.0 Guiding Principles	9	The EIS shall demonstrate adherence to the basic principles of environmental assessment as set out in the guidelines.	9, 17, All chapters	9.5, 17.4, Throughout the EIS
2.2 Aboriginal and Public Participation	9	In preparing the EIS, the Proponent shall inform and consult with all potentially affected Aboriginal and local communities, interested regional and national organizations and resource users.	7, 8, 9	7.1, 7.2, 7.3, 7.4, 7.5 ,8.1, 8.3, 9.5.2, Tables 8.1-1 and 8.3.1-1
2.2	9	The Proponent shall prepare a “plain-language summary” of the EIS in accordance with 4.1.2.	Plain Language Summary	—
2.2	9	Therefore, it is recommended that the Proponent: continue to provide up-to-date information, as it becomes available, to Aboriginal groups and the public and especially to the communities likely to be affected by the Project;	7, 8, 9	7.1, 7.2, 7.3, 7.4, 7.5, 8.3, 9.5.2
2.2	9	involve the main interested parties in determining how best to deliver that information, that is, the type of information required, format and presentation methods, as well as the need for community meetings;	7, 8	7.1, 7.2, 7.3, 7.4, 7.5, 8.3
2.2	9	explain the results of the EIS in a clear and direct manner to make the issues comprehensible to the widest possible audience; and	Executive Summary, Plain Language Summary	—
2.2	9	consider and acknowledge all requests for consultation with Aboriginal groups during project approvals and throughout the life of the project.	7	7.1, 7.2, 7.3, 7.4, 7.5, Tables 7.2.2-1, 7.3.3-1, 7.4-1 and 7.5.2-1
2.3 Aboriginal Traditional and Community Knowledge	9	Aboriginal traditional and community knowledge of the existing environment shall be an integral part of the EIS, to the extent that it is available to the Proponent.	9, 10, 15	9.5.3, Chapters 10 and 15 under ‘Aboriginal Ecological Knowledge’ heading and table in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
2.4 Sustainable Development	10	The proponent shall strive to integrate the factors of sustainable development into the planning and decision-making process for the Project, including seeking the views of interested parties and shall report on the results in the EIS.	1, 2, 8, 9, 11, 12, 13, 14, 16, 17	1.1, 2 Introduction, 8.4, 9.5.4; Throughout Chapters 11, 12, 13, 14, 16; 17.1, 17.4, 17.6.1
2.4 Sustainable Development	10	Promotion of sustainable development is a fundamental purpose of environmental assessment, and the Proponent shall include in the EIS consideration of: – the extent to which biological diversity is affected by the Project; – the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of present and future generations; and – the extent, distribution and duration of social and economic benefits.	9, 12, 13, 14, 16, 17	9.5.4; Throughout Chapters 12, 13, 14 and 16; 17.6
2.5 Precautionary Principle	10	One of the purposes of environmental assessment is to ensure that projects are considered in a careful and precautionary manner before action is taken in connection with them in order to ensure that such projects do not cause significant adverse environmental effects.	9, 11, 12, 13, 14, 16, 17	9.5.5; Throughout Chapters 11, 12, 13, 14, 16; 17.1, 17.4
		Principle 15 of the 1992 Rio Declaration on Environment and Development states that "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." In applying the precautionary approach, the Proponent shall: demonstrate that the proposed Project is examined in a careful and precautionary manner	9, 11, 12, 13, 14, 16	9.5.5; Throughout Chapters 11, 12, 13, 14, 16

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
2.5	10	– outline the assumptions made about the effects of the Project and the approaches to prevent and minimize these effects	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings and 'Summary of Environmental Effects' table in each VEC section; 11.3, 12.6, 13.4, 14.5, 16.9
2.5	11	– identify where knowledge uncertainty exists in the predictions of the environmental effects of the Project	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
2.5	11	– identify any follow-up and monitoring activities planned, particularly in areas where knowledge uncertainty exists in the prediction of the effects of the Project	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings and 'Summary of Environmental Effects' table in each VEC section; 11.3, 12.6, 13.4, 14.5, 16.9

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
Section 3 – Preparation and Presentation				
3.1 Study Strategy and Methodology	12	The Proponent shall explain and justify all methods used in the preparation of the EIS.	2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, Component Studies	2.3.1, 2.4.1, 2.5 Introduction, 2.6 Introduction, 2.10, 2.10.1.1, Figure 2.10-2, 5.1, 7.1, 8.1, 8.3; Throughout Chapter 9; Chapters 11, 12, 13, 14, 16 under the 'Approach to Environmental Effects Analysis' heading in each VEC section
3.1	12	In describing its overall approach, the Proponent shall explain how it used scientific, engineering, Aboriginal traditional and community knowledge.	4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16	4 Introduction, 5.1, 7.1, 8.3; Chapters 10 and 15 under the 'Information Sources and Data Collection' heading; Chapters 11, 12, 13, 14, 16 under the 'Approach to Environmental Effects Analysis' and 'Valued Environmental Component Selection' headings in each VEC section
3.1	12	All hypotheses and assumptions shall be clearly identified and justified.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
3.1	12	All data collection methods, models and studies shall be documented so that the analyses are transparent and reproducible.	10, 11, 12, 13, 14, 15, 16, Component Studies	Chapters 10 and 15 under the 'Information Sources and Data Collection' heading; Throughout Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge' heading in each VEC section
3.1	12	The degree of certainty, reliability and sensitivity of models used to reach conclusions shall be indicated.	11, 14, 15, 16, Component Studies	11.2.4.1, 14.2.4.1, 15.8.2, 15.8.3, 16.8.4.1
3.1	12	All conclusions regarding the receiving environment and predictions as well as the assessment of environmental effects shall be substantiated.	5, 11, 12, 13, 14, 16	Throughout Chapters 5, 11, 12, 13, 14, 16
3.1	12	The Proponent shall support all analyses, interpretation of results and conclusions with a review of the appropriate literature, providing all references required and indicating the public availability of all works consulted.	5, 11, 12, 13, 14, 16	Chapter 5 'References'; Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge' heading in each VEC section, and the 'References' section
3.1	12	Any contribution based on Aboriginal traditional and community knowledge shall be specified and the sources identified.	7, 8, 10, 15	7.2, 7.3, 7.4, 7.5, 8.4; Throughout Chapter 10; 15.5.7
3.1	12	The EIS shall identify all significant gaps in knowledge and explain their relevance to key conclusions drawn. The Proponent shall indicate the measures applied to address these gaps.	9, 11, 12, 13, 14, 16	9.5.5; Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
3.1	12	Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from Aboriginal traditional or community knowledge, the Proponent shall present the various points of view as well as a statement of the Proponent's conclusions.	10, 15	Chapter 10 under the 'Information Sources and Data Collection' (Aboriginal Ecological Knowledge) heading in each VEC section; 15.5.7
3.2 Presentation of the EIS	12	The Proponent shall present the EIS in the clearest language possible. The EIS shall refer to rather than repeat information already presented in other sections of the document. The Proponent shall present information, where technically feasible, using a standard Geographic Information System (GIS) mapping (digital) format with maps geo-referenced.	Chapters 1 to 17, Executive Summary, Plain Language Summary	1.5; Throughout
3.2	12	The EIS and all associated reports and studies shall use System International (SI) units of measure and terminology throughout.	Chapters 1 to 17, Component Studies	1.5; Throughout
3.2	12	A glossary defining technical words and acronyms shall be included.	Chapters 1 to 17	A 'List of Acronyms' is provided for each chapter; Technical words are defined where they are used in the text
3.2	12	Lines shall be numbered in the margin at appropriate intervals.	Chapters 1 to 17, Executive Summary	Throughout
3.2	12	The EIS shall include a Table of Concordance that cross-references the EIS Guidelines so that information requirements identified in the Guidelines are easily located in the EIS.	8	Appendix 8-1 (Table 8-1.1)
3.2	12	A key subject index is to be provided giving locations in the text by volume, section and sub-section.	At the end of Volume 3	—

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
3.2	12	The Proponent shall provide charts, diagrams and maps wherever useful to clarify the text, including a depiction of what the developed Project sites would look like from both an aerial and terrestrial perspective. Maps shall use a limited number of common scales to allow for comparison and overlay of mapped features. Maps shall indicate common and accepted local place names.	Chapters 1 to 17	Throughout Chapters 1 to 17, as required to support text
3.2	13	Throughout the preparation of the EIS, the Proponent should freely cite experiences from other environmental assessments, with emphasis on Newfoundland and Labrador and other Canadian examples, to support the methodology and value of the information provided, or as reasons in support of the selection of a preferred alternative.	11, 12, 13, 14, 16	Throughout Chapters 11, 12, 13, 14, 16, as required to support text
		To facilitate the identification of the documents submitted and their coding in the Canadian Environmental Assessment Registry, the title page of the EIS and its related documents should contain the following information: – project name and location; – title of the document, including the term “environmental impact statement”; – subtitle of the document; – name of the Proponent; – names of the consultants, as appropriate; – date.	Chapters 1 to 17	Each chapter title page

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
3.2	13	They shall be written in English and printed or copied on two sides of recycled *Environmental Choice* and/or *Forest Stewardship Council-certified* paper. The paper choice shall be conspicuously stated.	Volume 1 (Chapters 1-9), Volume 2A (Chapter 10), Volume 2B (Chapters 11-14) and Volume 3 (Chapters 15-17); Executive Summary, Plain Language Summary	Paper type is stated on the inside cover page of each volume
3.2	13	The electronic version of the EIS shall be submitted in a format so that it may be posted on the internet and in a manner which shall facilitate downloading and printing in part or in whole.	Volumes 1, 2A, 2B and 3, Executive Summary, Plain Language Summary	Throughout
Section 4 – Outline of the Environmental Impact Statement				
4.1 EXECUTIVE AND PLAIN LANGUAGE SUMMARIES				
4.1.1 Executive Summary of the EIS	14	The executive summary shall include identification of the Proponent, a brief project description, predicted environmental and socio-economic effects, mitigation measures, residual effects, follow-up and monitoring programs, an outline of the component studies, and a summary of the fundamental conclusions of the EIS.	Executive Summary	1.1; Throughout 3, 10, 11, 12, 13, 14, 15, 16, 17
4.1.1	14	The executive summary shall also include a review of Aboriginal concerns about the Project and the key findings of the Aboriginal consultation activities undertaken by the Proponent.	Executive Summary	Section 7
4.1.1	14	The executive summary should be written in terms understandable to the general public and in such a manner as to allow reviewers to focus on items of concern.	Executive Summary	Throughout

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.1.2 Plain Language Summary of the EIS	14	The plain language summary shall provide a short description of the Project, its predicted effects and their significance, and proposed mitigation. It shall also include a schedule of major Project steps, before, during and after construction.	Plain Language Summary	3, 4, 10, 11
4.1.2	14	The summary should include pictures and maps that will enable the reader to understand the location, size, appearance and function of the project.	Plain Language Summary	3, 4
		The summary shall be available in: English, French, Innu-aimun (Labrador and Quebec dialects), Naskapi and Inuktitut.	Plain Language Summary	Plain Language Summary is available in these languages
4.2 INTRODUCTION				
4.2.1 Identification of the Proponent	14	Shall introduce readers to the Proponent by providing pertinent corporate information.	1	1.2
4.2.1	14	(a) Name of corporate body and mailing address	1	1.2
4.2.1	14	(b) Chief Executive Officer	1	1.2
4.2.1	14	(c) Principal contact person for purposes of environmental assessment	1	1.2
4.2.1	14	(d) Ownership of rights and interests in the Project and associated natural resources	1	1.2
4.2.1	14	(e) Corporate accountability for management of environmental and socio-economic effects. Operational arrangements and corporate and management structures, including the linkage of these factors between the Proponent, its parent companies and any other organizations with operational or ownership rights	1	1.2
4.2.1	14	(f) Environmental and community relations policies	2, 3	2.14, Appendix 3-4
4.2.1	14	(g) Key elements of the Proponent's environment, health and safety management system and how the system will be integrated into the Project	2	2.14
4.2.1	14	In addition the Proponent shall describe its history in Canada's hydroelectricity industry (generation and transmission), with specific reference to the existing hydroelectric generation/transmission project at Churchill Falls, and the proposed Lower Churchill Hydroelectric Generation Project.	1	1.2, Figure 1.2-2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.2.2 Overview of the Project	15	The Proponent shall briefly summarize the Project, by presenting the project components, associated activities, scheduling details, the timing of each phase of the Project and other key features. If the Project is part of a larger sequence of projects, the Proponent shall outline the larger context and present the relevant references, if available.	1, 3, 17	1.1, Throughout Chapter 3; 17.1, 17.2;
4.2.3 Purpose of the EIS	15	The purpose of the EIS shall be described.	1	1.5
4.2.4 Relationship to Legislation, Permitting, Regulatory Agencies & Policies	15	EIS shall identify and discuss all relationships between the Project and relevant legislation, regulations and policies (municipal, provincial, and federal).	1, 3, 11, 12, 13, 14, 16	1.3, 3.4.1 Appendix 3-1; Chapters 11, 12, 13, 14, 16 under the 'VEC Selection' heading and 'Key Indicators and Associated Measurable Parameters' table in each VEC section
4.2.4	15	Pertinent government policies, such as land and water resources development and use policies that may influence environmental management in the project area, and the Project's compliance with respect to these policies are to be addressed. The EIS shall describe how project siting, design and management have been influenced by compliance with these legislation and policies.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section, and the 'Effects Mitigation Measures' section in each 'Environmental Assessment Summary'
4.2.4	15	The Proponent shall provide a comprehensive list of anticipated permits and regulatory approvals required for the undertaking. The list shall include the following details: – activity requiring regulatory approval	3	3.4.1, Appendix 3-1
4.2.4	15	– name of permit or regulatory approval	3	3.4.1, Appendix 3-1
4.2.4	15	– name of legislation applicable in each case	3	3.4.1, Appendix 3-1
4.2.4	15	– regulatory agency responsible for each permit of approval	3	3.4.1, Appendix 3-1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.2.5 Land Claims Agreements and Interim Agreements	15	The EIS shall identify any publicly available agreements or arrangements, that may be in effect, entered into between the Proponent and / or the Government of Canada and / or the Government of Newfoundland and Labrador and / or Aboriginal group(s) in the context of land claims, and address how they may affect or be affected by the Project.	7, 16	7.2, 7.3, 7.4, 7.5, 16.4.5.1, 16.5.5
4.2.6 Other Registrations	16	The Proponent shall indicate whether any other registrations have previously been submitted in relation to this Project, or are to be submitted for environmental assessment in the future as a result of this Project.	1	1.4
4.3 THE PROPOSED UNDERTAKING				
4.3.1 Need, Purpose and Rationale of the Project	16	"Need for" and "Purpose of" the Project should be established from the perspective of the Proponent and provide a context for the consideration of alternatives to the Project.	2	2.2
4.3.1	16	The statement of the Project's justification shall be presented in both energy and economic terms, shall provide a clear description of methodologies, assumptions and conclusions used in the analysis, and shall include an evaluation of the following: (precedes the list of 9 items already in the Table).	2	2.3, 2.4, 2.6, 2.7
4.3.1	16	This section of the EIS shall provide a comprehensive explanation of the need, purpose and rationale for the Project.	2	2.1, 2.3, 2.4, 2.5, 2.8, 2.10
4.3.1	16	1. Current and forecasted provincial electricity supply and demand.	2	2.3.1
4.3.1	16	2. Current and forecasted provincial electricity conservation.	2	2.3.1
4.3.1	16	3. Current and future provincial transmission line network.	2	2.3.1
4.3.1	16	4. Current and future interprovincial transmission line network.	2	2.3.1, 2.3.5
4.3.1	16	5. Current exports by the Proponent to markets outside the province.	2	2.5.13
4.3.1	16	6. Export market opportunities, forecasts and expected evolution.	2	2.1, 2.3.1
4.3.1	16	7. Risks to the Project, market prices and schedule delays, interest rates and other risk factors relevant to the decision to proceed with the Project.	2	2.5.14.2, 2.10 and associated figures
4.3.1	16	8. Projected financial benefits, projected expenditures and effects on electricity rates of the Project (including their distribution) as measured by standard financial indicators.	2, 3	2.8, 3.7, 3.8

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.3.1	16	9. Relationship with the Newfoundland and Labrador's 2007 Energy Plan.	2	2.1, 2.5 Introduction
4.3.2 Alternatives				
4.3.2.1 Alternatives to the Project	17	The EIS shall contain an analysis of alternatives to the Project, including the following: – Management of electricity demand through utility-based energy efficiency and conservation initiatives	2	2.3.1.4
4.3.2.1	17	– Alternative generation sources for the Project (e.g., hydrocarbons, wind, other hydro projects such as run-of-river projects or combinations of generation sources)	2	2.5
4.3.2.1	17	– The addition by the Proponent of more capacity at existing generation facilities	2	2.6.1
4.3.2.1	17	– Status quo (no Project)	2	2.6.1
4.3.2.1	17	Among the alternatives to the Project to be considered, the Proponent shall pay close attention to how they would be integrated within Newfoundland and Labrador's 2007 Energy Plan.	2	2.1, 2.5.1 Introduction, 2.5.5
4.3.2.1	17	This shall include a description of the conditions or circumstances that could affect or alter these choices, such as market conditions, regulatory changes and other transmission line developments, either prior to construction or during the life of the Project.	2	2.5
4.3.2.1	17	The EIS shall include a comparative analysis of the environmental effects and technical and economic feasibility of alternatives that led to the choice of the selected Project alternative.	2	2.5
4.3.2.1	17	The comparative analysis shall indicate how the Proponent took into account the sustainable development objectives outlined previously in these Guidelines in determining criteria for selecting the preferred alternative.	2, 9, 11, 12, 13, 14, 16	2 Introduction, 2.1; Throughout Chapters 11, 12, 13, 14, 16
4.3.2.1	17	The Proponent shall include an evaluation of the thresholds for economic viability of the Project and considerations respecting the timing of phases and components of the Project.	2	2.4.1, 2.4.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.2.1	17	The Proponent shall also indicate under what circumstances a change in economic conditions may influence its selection of the preferred alternative.	2	2.5, 2.6, 2.7
4.3.2.2 Alternative Means of Carrying out the Project	17	Alternative means of carrying out the Project, which are technically and economically feasible, and the environmental effects of any such alternative means shall be discussed.	2	2.12
4.3.2.2	17	The EIS shall describe design and siting alternatives for the transmission line and ancillary facilities (such as roads, convertor stations, electrodes and temporary infrastructure).	2	2.12
4.3.2.2	17	The preferred alternatives shall be identified, with the selection based on clearly described methods and criteria.	2	2.12, 17.7
4.3.2.2	17	An explanation shall be included of how environmental factors affect the design and consideration of alternatives.	2, 4, 17	2.12, 2.13; Chapter 4 under the 'Effects on Project Design, Construction, and Operations and Maintenance' heading; 17.7
4.3.2.2	17	The Proponent shall provide the rationale for selecting Project components and shall discuss the state of the art of the various technologies being proposed.	2	2.12
4.3.2.2	18	The Proponent shall indicate the known experience with, and the effectiveness and reliability of these techniques, procedures and policies, particularly under arctic or subarctic conditions, in Canada and elsewhere, and their relation to best practice in Canada.	2	2.12
4.3.2.2	18	This discussion shall also show how design, engineering and proposed procedures are compatible with the environment and the local communities and shall minimize adverse environmental and social effects.	2, 11, 12, 13, 14, 16, 17	2.12, 2.13, 2.14; Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section; 17.7

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.2.2	18	The EIS shall analyze and compare the design alternatives for the Project in relation to their environmental and social costs and benefits, including those alternatives which cost more to build and / or operate but which result in reduced adverse environmental effects or more durable social and economic benefits.	2, 11, 12, 13, 14, 16	2.11, 2.12; Chapters 11, 12, 13, 14, 16 under the 'Evaluation of Project Alternatives' heading in each VEC section
4.3.2.2	18	Alternatives for the pace and scale of the operation shall be discussed, and the chosen alternative justified.	2	2.11, 2.12
4.3.2.2	18	The Proponent shall also indicate under what circumstances a change in economic conditions may influence its selection of preferred alternative means.	2	2.12, 2.13
4.3.2.2	18	Alternative means of carrying out the Project shall include: (a) Transmission Line Corridor Selection – Following the Trans Labrador Highway Phase 2 and 3 along its entirety across southern Labrador to the Strait of Belle Isle.	2	2.12.6, Table 2.12.6-1, Figure 2.12.6-1
4.3.2.2	18	– Following a portion of the Trans Labrador Highway, Phase 3, in combination with new corridor(s) across southern Labrador to the Strait of Belle Isle.	2	2.12.6, Table 2.12.6-1, Figure 2.12.6-1
4.3.2.2	18	– Alternative corridors across the Long Range Mountains, including to the Cat Arm Hydroelectric Project and then following the existing Cat Arm Hydroelectric Project transmission corridor south.	2, 17	2.12.6, Table 2.12.6-1, Figure 2.12.6-1
4.3.2.2	18	– Alternative corridors across the Strait of Belle Isle including alternative landing sites and configurations.	2	2.12.4
4.3.2.2	18	– Alternative means of constructing/installing subsea cables (e.g., tunnelling entire route) including alternative means/locations for disposal of dredge/side-cast spoils.	2	2.12.3
4.3.2.2	18	– Alternative routes/locations for temporary and permanent access roads, laydown areas, work camps.	2	2.12.7, 2.13
4.3.2.2	18	– Alternative sites for placement of electrodes (marine and land) and associated infrastructure.	2	2.12.5
4.3.2.2	18	– Alternative means of accessing the corridor including, but not limited to, helicopter, permanent access roads, temporary access roads and ice roads.	2	2.12.7, 2.13

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.2.2	18	(b) Layout, Clearing and Siting The Proponent shall evaluate layout and locations, including access roads or trails, quarries, borrow pits and camps, based on a variety of engineering and environmental considerations. For access roads, the EIS shall consider alternative locations of stream crossings and types of crossing structures and the use of winter roads. For clearing, the Proponent shall consider alternative clearing methods, including mechanical and manual clearing. For quarries, access roads, and tower installations, the EIS shall outline the methods for prediction and prevention of acid rock drainage and metal leaching to be used in the site selection process.	2, 12, 13, 16	2.12.7, 2.13; Chapters 12, 13, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.3.2.2	19	(c) Construction Sequence The EIS shall consider alternative construction sequences.	2, 3	2.12.7
4.3.2.2	19	(d) Construction Labour Force Accommodation The EIS shall describe alternative labour force accommodation strategies (e.g., number and location of camps, in-community housing). These evaluations are to consider economic, social and worker conditions (including health and hygiene) as well as any other relevant community, including Aboriginal community, considerations and environmental factors.	2, 3, 16	2.12.7
4.3.2.2	19	(e) Operations and Maintenance Alternative means of controlling vegetation within the right of way, including both mechanical and chemical means.	2, 3, 12, 13, 16	2.12.7, 3.5; Chapters 12, 13, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.3.2.2	19	Alternative locations of permanent access roads.	2, 3	2.12.7, 2.13, 3.4.2.1
4.3.2.2	19	Where such facilities are yet to be located, a site selection process and evaluation process shall be described to demonstrate how potential environmental effects will be avoided or mitigated.	2	2.12.7, 2.13
4.3.3 Project Description	19	The Proponent shall describe the scope of the Project for which the EIS is being conducted.	1, 3, 17	1.1, 3.1, 17.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.3	19	The Proponent shall produce appropriate audiovisual materials describing the Project.	7, 8	7.1[b], 8.3
4.3.3	19	The proposed principal structures and related works to be described include but is not limited to the following: – towers	3	3.3.2.1
4.3.3	19	– conductors	3	3.3.2.1
4.3.3	19	– converter stations	3	3.3.1, 3.3.3
4.3.3	19	– electrodes and related infrastructure	3	3.3.4
4.3.3	19	– cable crossings of the Strait of Belle Isle	3	3.3.2.2
4.3.3	19	– cable landing sites and telecommunications services for Project operations (microwave radio system, fibre optic cable system)	3	3.3.2.1, 3.3.2.3
4.3.3	19	Related works and activities including all temporary facilities required for the construction and operation of the previously mentioned facilities, in particular: – Work camps	3	3.4.2.3
4.3.3	20	– Permanent and temporary access roads, trails and ice roads	3	3.4.2.1
4.3.3	20	– Bridges and watercourse crossings (including fording activities)	3	3.4.2.2
4.3.3	20	– Infrastructure for wastewater treatment & waste management	3	3.3.1, 3.4.2.3, 3.4.3.1
4.3.3	20	– Energy supply for camps and worksites	3	3.4.2.3
4.3.3	20	– Drinking water supply	3	3.4.2.3, 3.4.3.1
4.3.3	20	– Borrow pits and quarries	3	3.4.2.5
4.3.3	20	– Management and disposal of excavated material including that associated with marine works	3	3.4.3.6
4.3.3	20	– Management and disposal of hazardous material and waste	3	3.4.3.6
4.3.3	20	– Construction worksites and storage areas	3	3.4.2.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.3.1 Spatial and Temporal Boundaries	20	A precise description of the spatial boundaries of the Project shall be presented accompanied by map(s) of appropriate scale showing the entire project area with the proposed principal structures and related works.	3	3.2
4.3.3.1	20	Detailed digital GIS based files shall be available showing the locations of any camps, structures, routes, clearings, etc.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.3.3.1	20	The Proponent shall provide aerial images that illustrate representative habitats within each study area.	Vegetation Component Study (CS)	Throughout
4.3.3.1	20	The temporal boundaries of the Project shall cover all phases of the project: construction, operation, maintenance, foreseeable modifications and abandonment and decommissioning of works and the rehabilitation of the sites affected by the Project. If the Proponent does not believe the full temporal boundaries should be used for a phase of the Project, the report shall identify the boundaries used and provide a rationale for the boundaries selected.	9, 11, 12, 13, 14, 16	9.3.2; Chapters 11, 12, 13, 14, 16 under the 'Temporal Boundaries' heading in each VEC section
4.3.4 Construction	20	The EIS shall show the construction and commissioning schedules for Project elements, based on the most current information available.	3	3.4.1, Figure 3.4.1-1
4.3.4	20	In addition, the approach, details, materials, methods, locations and security measures of all planned construction activities related to the physical features, including site preparation, permanent and temporary infrastructure and site rehabilitation shall be presented including estimates of magnitude or scale where applicable.	3, 11, 12, 13, 14, 16	3.4; Chapters 11, 12, 13, 14, 16 under the 'Construction' heading in each VEC section
4.3.4	20	– Transmission Line – Describe the construction methods for the transmission line, including: – towers	3	3.4.3.2
4.3.4	20	– poles	3	3.4.3.2, 3.4.3.4
4.3.4	20	– conductors	3	3.4.3.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.4	20	– telecommunications services for Project operations (microwave radio system, fibre optic cable system)	3	3.3.6
4.3.4	21	– crossings of water bodies	3	3.4.2.2
4.3.4	21	– access roads	3	3.4.2.1
4.3.4	21	– modifications to existing facilities	3	3.4.3.5
4.3.4	21	– Describe the routing, type of line and interconnection points of the transmission lines	3	3.3.2.1, 3.3.2.3
4.3.4	21	– Describe the volume of wood (e.g., merchantable and non-merchantable) within the right-of-way and clearing, salvage and removal methods	3, 12	3.4.3.2, 12.2.5.8
4.3.4	21	– Describe the communications plan, with respect to aircraft, that is required with the Department of National Defence (5 Wing Goose Bay) to prevent any incidents from occurring	3	3.4.1.1
4.3.4	21	– Describe any possible restrictions to low level flying activities	3	3.4.1.1
4.3.4	21	– Describe any possible restrictions to land use, including measures of notifying land users of ongoing construction activities	3	3.4.1.1
4.3.4	21	– Convertor stations	3	3.4.3.1
4.3.4	21	– Describe the construction methods for the buildings, offices, maintenance areas, water and sewage works, electrical equipment and switchgear	3	3.4.3.1, 3.4.2.3, 3.4.2.4
4.3.4	21	– Electrodes	3	3.4.3.4
4.3.4	21	– Describe the construction methods for the onshore junction houses, installation of the bundled individual cables and electrodes	3	3.4.3.4
4.3.4	21	– Cable crossings and landing sites at the Strait of Belle Isle	3	3.4.3.3
4.3.4	21	– Describe the construction methods for the subsea, tidal and on land preparation, protection techniques for cables, tunnelling, drilling, trenching, backfilling and blasting activities, ocean disposal, cable pull-in and laying, onshore landing stations	3	3.4.3.3
4.3.4	21	– Right-of-Way Clearing	3	3.4.3.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.4	21	– Describe the work required and schedule for right-of-way preparation including volume of merchantable and non-merchantable wood, location of cleared areas, harvesting strategy (e.g., roads, labour)	3, 12	3.4.1, 3.4.3.2, 12.2.5.8
4.3.4	21	– Describe methods for wood clearing/harvesting	3	3.4.3.2
4.3.4	21	– Describe the work required to prepare the sea bed for cable laying and associated infrastructure	3	3.4.3.3
4.3.4	21	– Describe the work required to prepare the cable landing sites	3	3.4.3.3
4.3.4	21	– Access Infrastructure	3	3.4.2.1
4.3.4	21	– Describe the permanent and temporary access infrastructures (including road, air and water) to be constructed, as well as existing infrastructures to be utilized	3	3.4.2.1
4.3.4	21	– Describe new access roads or trails and corridors (including locations, current and anticipated traffic, technical characteristics and general road construction standards such as maintenance, useful life, ditches, bridges and culverts including fording activities, and use of dust-control and de-icers) and any modifications and / or upgrades required to existing access infrastructures	3, 12, 13, 16	3.4.2.1; Chapters 12, 13, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.3.4	22	– Describe the communications plan, with respect to aircraft, that is required with the Department of National Defense (5 Wing Goose Bay) to prevent any incidents from occurring	3	3.4.1.1
4.3.4	22	– Describe any possible restrictions to low level flying activities	3	3.4.1.1
4.3.4	22	– Describe any possible restrictions to land use, including measures of notifying land users of ongoing construction activities	3	3.4.1.1
4.3.4	22	– Borrow Pits, Quarries and Spoil Areas	3	3.4.2.5
4.3.4	22	– Identify the source, quantity and end use of all rock and aggregate materials to be used	3	3.4.2.5
4.3.4	22	– Identify the source, quantity and proposed disposal location of all excavated materials including marine disposal	3	3.4.3.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.4	22	– If quarrying/excavating/using rock with the potential for acid generation, outline the methods for prediction and prevention of metal leaching and acid rock drainage (ML/ARD), and provide an assessment of potential for impacts of metal leaching and acid rock drainage (ML/ARD)	3	3.4.2.5
4.3.4	22	– Personnel Requirements	3, 16	3.7.1, 16.4.5.4
4.3.4	22	– Present the estimated size of projected workforce by month or quarterly over the construction phase, indicating occupations by National Occupation Classification (NOC) Codes, skills, entry requirements and duration of work	3, 16	3.7.1, 3.7.3, Table 3.7.3-1, 16.4.5.4, Table 16.4.5-2
4.3.4	22	– Whether the positions are full-time equivalent or actual positions. If they are actual positions, the breakdown of full-time and part-time or full-year and part-year positions	3, 16	3.7, 16.4.5.4
4.3.4	22	– The estimated skill composition demands for the workforce (i.e., do the positions require the experience of a journeyperson or apprentice)	3, 16	3.7.1, 16.4.5.4
4.3.4	22	– Estimated percentage of the hired workforce from Newfoundland and Labrador	3	3.7
4.3.4	22	– Estimated percentage of the hired workforce from Labrador	3	3.7
4.3.4	22	– Describe the anticipated working schedule for Project construction activities	3, 16	3.7.3.1, 16.3.5.1, 16.7.5.1
4.3.4	22	– Protected Areas	3, 15, 16	3.3.2, 15.5.12, 16.5
4.3.4	22	– Where the final alignment of the proposed, or alternate corridors or construction infrastructure comes within one kilometre or less of an existing or proposed provincial protected area, the EIS shall describe the placement of towers and associated access and construction infrastructure (i.e., roads, trails, bridges, quarries etc.)	16	16.5.5.6
4.3.4	22	– Temporary Structures and Infrastructure	3	3.4.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.4	22	– Describe camp locations, drinking water supply source, method of managing wastewater and discharge areas, location and capacity and operating conditions of solid waste disposal sites, power supply, and management of any other installations (including fuel storage depots) required for the camps to function properly and safely	3	3.4.2.3
4.3.4	23	– Provide the scope and location of any communication and telecommunications systems required by the Project (e.g., transmission towers, access roads, energy sources)	3	3.3.6
4.3.4	23	– Identify and quantify the use, management and production of dangerous products and hazardous waste generated by the Project during the construction phase	3, 11	3.4.3.6, 3.6.2, 11.2.5, Table 11.2.5-5
4.3.4	23	– Describe construction-water sources and methods of accessing and delivering water to construction sites for purposes such as mixing cement and drilling rock, Estimate the volumes of water required for construction purposes	3	3.4.2.6, 3.4.3.3
4.3.4	23	– Identify the location, capacity and access to material and fuel receiving, handling and storage areas	3	3.4.2.4
4.3.4	23	– Describe the location, capacity and access to disposal and recycling sites for domestic and construction waste, including those developed during construction and existing sites to be used for the Project	3	3.4.3.6
4.3.4	23	– Identify and describe potential landing areas for wood piles or wood storage sites	3	3.4.3.2
4.3.4	23	– Provide an inventory of equipment and materials required for the Project, including hazardous materials	3	3.4.5
4.3.4	23	– Describe the storage of hazardous materials	3	3.6.2
4.3.4	23	– Describe any storage or use of explosives	3	3.4.3.2, 3.6.2
4.3.4	23	– Describe the communications plan, with respect to aircraft, that is required with the Department of National Defence (5 Wing Goose Bay) to prevent any incidents from occurring	3	3.4.1.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.4	23	– Describe any possible restrictions to low level flying activities	3	3.4.1.1
4.3.4	23	– Mitigation and Compensation Works:	3, 11, 12, 13, 14, 16	3.6; Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section; 11.3.1, 12.6.1, 13.4.1, 14.5.1, 16.9.1
4.3.4	23	– Describe any physical works proposed as mitigation or compensation measures (e.g., sedimentation control)	12, 13, 14, 16	Throughout Chapter 12; 12.6.1, Tables 12.6.1-1, and 12.6.1-2; 13.2.5.1, 13.2.6.1, 13.3.5.1, 13.3.6.1, Tables 13.4.1-1 and 13.4.1-2; 14.2.5.1, Table 14.5.1-1; 16.6.5.1, Table 16.9.1-1
4.3.4	23	– Describe the communications plan, with respect to aircraft, that is required with the Department of National Defence (5 Wing Goose Bay) to prevent any incidents from occurring	3, 16	3.4.1.1, 16.5.5.1, 16.9.2
4.3.4	23	– Describe any communications plan to notify land users of ongoing construction activities to address potential incidents and conflicts	3	3.4.1.1
4.3.4	23	– Describe any restrictions on worker's fishing, hunting or other land use activities to prevent adverse effects on local fish and wildlife populations	12, 13	12.3.5.1, 12.4.5.1, 12.5.5.1, Table 12.6.1-1; 13.3.5.1, 13.3.6.1, Tables 13.4.1-1 and 13.4.1-2
4.3.4	23	– Demobilization:	3	3.4.6
4.3.4	23	– Describe the approach and conceptual plans for demobilizing all structures used or created during construction that are of a temporary nature	3	3.4.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.3.4	24	– Identify, within the limits of the Proponent's knowledge and control, how the operation, use, development, possible rebuilding and eventual dismantling and demobilization of certain installations shall be handled in consideration of other uses	3	3.4.6
4.3.4	24	– Specifically note, to the extent possible, whether some installations, including all of the access infrastructures, may be used as they are, or may be converted or salvaged for other purposes by other proponents or communities, or if they must be dismantled and demobilized at the end of their useful life. The proposed means of rehabilitation of any areas to be abandoned shall be described	3	3.4.6
4.3.5 Operations and Maintenance	24	All aspects of the Operations and Maintenance of the undertaking shall be detailed in this section of the EIS. This shall include: (a) Transmission Lines and Access Roads (or trails): – Maintenance (e.g., vegetation management, dust control, de-icing) of roads or trails and transmission facilities shall be described	3, 11	3.5.1, 3.5.2, 11.2.6
4.3.5	24	– Electromagnetic fields shall be described temporally and spatially	3	3.5.3
4.3.5	24	– Maintenance of underwater cables	3	3.5.2.2
4.3.5	24	– Maintenance of shore electrodes	3	3.5.2.2
4.3.5	24	– Describe the communications plan, with respect to aircraft, that is required with the Department of National Defence (5 Wing Goose Bay) to prevent any incidents from occurring	3, 16	3.4.1.1, 16.9.2
4.3.5	24	– Describe any possible restrictions to low level flying activities	3, 16	3.4.1.1, 16.9.2
4.3.5	24	– Describe any communications plan to notify land users of ongoing Operations and Maintenance activities to address potential incidents and conflicts	3, 16	3.4.1.1, 16.5.6.4
4.3.5	24	(b) Convertor stations:	3	3.5.1, 3.5.2
4.3.5	24	– Electromagnetic fields shall be described temporally and spatially	3	3.5.3
4.3.5	24	(c) Electrodes	3	3.5.1, 3.5.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.3.5	24	– Electromagnetic fields shall be described temporally and spatially	3	3.5.3
4.3.5	24	(d) Cable crossings and landing sites at Strait of Belle Isle:	3	3.5.1, 3.5.2
4.3.5	24	– Electromagnetic fields shall be described temporally and spatially	3	3.5.3
4.3.5	24	– Describe any temperature rise in water and sediments adjacent to the cable and any associated environmental effects	3, 14	3.5.3, 14.2.6.1
4.3.5	25	(e) Personnel Requirements:	3, 16	3.7.2, 16.4.6.4
4.3.5	25	– A profile of the estimated work force (including occupations by National Occupation Classification (NOC) Codes, skills, entry requirements and duration of work) shall be provided	3, 16	3.7.3, 16.4.6.4
4.3.5	25	– The estimated number of workers required by occupation by month	3, 16	3.7.2, 3.7.3, 16.4.6.4
4.3.5	25	– Whether the positions are full-time equivalent or actual positions. If they are actual positions, the breakdown of full-time and part-time or full-year and part-year positions	3, 16	3.7.2, 3.7.3,16.4.6.4
4.3.5	25	– The skill composition demands for the workforce (i.e., do the positions require the experience of a journeyperson or apprentice)	3, 16	3.7.2, 3.7.3,16.4.6.4
4.3.5	25	– Estimated percentage of the hired workforce from Newfoundland and Labrador	3	3.7
4.3.5	25	– Estimated percentage of the hired workforce from Labrador	3	3.7
4.3.5	25	– Working schedules for Project Operations and Maintenance activities shall be included.	3	3.7
4.3.5	25	(f) Fuel and Dangerous and Hazardous Products and Waste:	3, 11, 12, 13, 14, 16	3.4.5, 3.6.2; Chapters 11, 12, 13, 14, 16 under the 'Operations and Maintenance' heading in each VEC section; 11.3.1, 12.6.1, 13.4.1, 14.5.1, 16.9.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.3.5	25	– Identify and quantify the use, management and production of dangerous and hazardous products and waste generated by the Project during the Operations and Maintenance phase	3, 11, 12, 13, 14, 16	3.4.5, 3.6.2; Chapters 11, 12, 13, 14, 16 under the 'Operations and Maintenance' heading in each VEC section; 11.3.1, 12.6.1, 13.4.1, 14.5.1, 16.9.1
4.3.5	25	– Describe material and fuel receiving, handling and storage areas and provision for management and disposal of waste and discarded equipment	3, 12, 13, 14, 16	3.4.5, 3.6.2; Chapters 12, 13, 14, 16 under the 'Operations and Maintenance' heading in each VEC section; 12.6.1, 13.4.1, 14.5.1, 16.9.1
4.3.5	25	– Describe procedures for management and remediation of spills of hazardous/dangerous material	3, 5, 11, 12, 13, 14, 16	3.6.2, Appendix 3-3, 5.6.1; Chapters 11, 12, 13, 14, 16 under the 'Accidents and Malfunctions' heading in the 'Environmental Effects Summary' in each VEC section
4.3.5	25	(g) Operating Requirements	3	3.5, Appendix 3-1
4.3.5	25	– The Proponent shall describe, in addition to permits and authorizations, all other requirements to operate the Project, including leases and insurance	3	3.5, Appendix 3-1
4.3.6 Decommissioning	25	The EIS will present an approach for the decommissioning phase of the Project, which sets out a commitment to address: (a) environmental planning and mitigation measures	3	3.5.4
4.3.6	25	(b) socio-economic mitigation measures	3	3.5.4
4.3.6	25	(c) public health and safety procedures	3	3.5.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4 Environment				
4.4.1 Identification of Issues and Selection of Valued Environmental Components (VECs)	25	The Proponent shall identify the key issues related to the Project.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Potential Environmental Issues' heading in each VEC section
4.4.1	25	To help focus the environmental assessment, the Proponent shall identify and justify, based on a clearly defined set of criteria, those components of the biophysical and socioeconomic environment that are most valued and / or sensitive, and which have a meaningful potential to be affected by the Project (the "Valued Environmental Components" or VECs).	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Valued Environmental Component Selection' heading in each VEC section
4.4.1	26	In considering VECs, the Proponent shall recognize: – that the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans	11, 12, 13, 14	Chapters 11, 12, 13, 14 under the 'Valued Environmental Component Selection' heading in each VEC section
4.4.1	26	– that culture and way of life of those using the area affected by the Project may also be considered as VECs	16	Chapter 16 under the 'Valued Environmental Component Selection' heading in each VEC section
4.4.1	26	– and that functional relationships within the environment may also be considered as VECs	12, 13, 14	Chapters 12, 13, 14 under the 'Valued Environmental Component Selection' heading in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.2 Study Areas	26	The Proponent shall determine study areas specific to each VEC.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Environmental Assessment Study Areas' heading in each VEC section
4.4.2	26	Each study area should be inclusive of the landscape necessary to predict the environmental effects of the Project on each VEC. For the purposes of assessing the Project's effects on the socio-economic environment, the study areas shall take into consideration the landscape used to support contemporary and historic Aboriginal and non-Aboriginal land use.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Environmental Assessment Study Areas' heading in each VEC section
4.4.2	27	The rationale used to delineate the boundaries of the study areas shall be provided	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Environmental Assessment Study Areas' heading in each VEC section
4.4.3 Previous Development	27	The EIS should include a concise discussion (where such information is available and relevant to the Projects potential environmental effects) of similar past large scale transmission line projects and any other large scale linear projects within and beyond the boundaries of the province, as appropriate.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge' heading in each VEC section
4.4.3	27	and the environmental effects that have occurred as a result	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge' heading in each VEC section
4.4.3	27	where overlapping environmental effects are anticipated	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.3	27	and the measures that have been taken to mitigate or manage these overlapping environmental effects	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction', 'Operations and Maintenance ' and 'Cumulative Effects Assessment' headings in each VEC section
4.4.3	27	Discussion of overlapping environmental effects should include consideration of the degree to which those mitigation measures have been successful.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge', 'Construction', 'Operations and Maintenance ' and 'Cumulative Effects Assessment' headings in each VEC section
4.4.3	27	Any long-term monitoring or follow-up programs of relevance to these overlapping environmental effects and the key results should also be described. This information will help interested parties to understand the potential environmental effects of the Project and how they may be addressed.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Existing Knowledge', 'Cumulative Effects Assessment' and 'Monitoring and Follow-up' headings in each VEC section
4.4.4 Description of the Existing Environment	27	The EIS shall identify the study area for each VEC and include a description of the existing biophysical and socio-economic environment and the resources within it that will be affected or that might reasonably be expected to be affected, directly or indirectly, by the Project.	10, 15, Component Studies[c]	Throughout
4.4.4	27	The EIS shall describe relevant aspects of the existing environment in the study area for each VEC prior to development of the Project, which constitutes the reference state of the environment.	10, 15, Component Studies[c]	Throughout

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.4	27	This description of the environment must reflect available Aboriginal traditional and community knowledge	10, 15, Component Studies[c]	Chapters 10, 15 under the 'Aboriginal Ecological Knowledge' heading; Community knowledge throughout
4.4.4	27	as well as social	15	15.3, 15.5
4.4.4	27	cultural	15	15.2, 15.5.7
4.4.4	27	and economic activities and values related to the described components	15	15.4, 15.5, 15.6, 15.7
4.4.4	27	The description, depending on the study area, would also include physical/chemical characterization of sea bed sediments that may be disturbed and of any proposed marine disposal site.	10, Marine Environment CS[c]	10.5.2.2, 10.5.8.3
4.4.4	28	Where appropriate and possible to do so, the Proponent shall present a time series of data and sufficient information to establish the averages, trends and extremes of the data that are necessary for the evaluation of potential environmental and cumulative effects of the Project.	10, 15	Throughout
4.4.4	28	For each VEC, the Proponent should consider and justify how far back in time and how far into the future the environmental assessment should be conducted.	9, 11, 12, 13, 14, 16	9.3.2; Chapters 11, 12, 13, 14, 16 under the 'Temporal Boundaries' heading and 'Cumulative Effects Assessment ' in each VEC section
4.4.4	28	The Proponent will identify any deficiencies in information, and how these deficiencies will be addressed.	6, 10, 15	6.5.3; Chapters 10, 15 under the 'Information Sources and Data Collection Methods' sections
4.4.4	28	Using original and existing qualitative and quantitative surveys and studies, the EIS shall describe the components of the biophysical and human environments likely to be affected by the Project.	10, 15, Component Studies[c]	Throughout

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.4.4	28	If the information available from government or other agencies is insufficient or no longer representative, the Proponent shall complete the description of the environment with current surveys and studies.	10, 15, Component Studies[c]	Throughout
4.4.4	28	Components of the environment must be described and this shall include the necessary data and the required information to understand, interpret and address the confidence levels of these data (methods, survey dates and times, weather conditions, location of sampling stations, etc. as appropriate)…	10, 15, Component Studies[c]	Throughout
4.4.4	28	…and shall employ appropriate methods to identify, understand, analyze and assess the environmental effects of the Project.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Approach to environmental Effects Analysis', 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.4.4	28	If the required information is neither available nor able to be generated, the Proponent shall include an explanation of efforts made to obtain the information and, where possible, reasons why it cannot or will not be provided.	6, 10, 15	6.5.3; Chapters 10, 15 under the 'Information Sources and Data Collection Methods' section
4.4.4	28	In addition, the EIS shall describe environmental interrelationships and sensitivity to disturbance.	10, 15	Throughout
4.4.4	28	If the study results or data have been extrapolated or otherwise manipulated to depict environmental conditions in the study area modeling methods and equations shall be described with calculations of margins of error and / or confidence limits.	10, 15, Component Studies[c]	Chapters 10, 15 under the 'Information Sources and Data Collection Methods' section
4.4.4	28	A description of the existing environment shall be developed for each alternative drawing specific reference to the VECs. References are attached at the end of these Guidelines to provide direction to the Proponent.	10, 15	Throughout
4.4.4.1 Atmospheric Environment	28	The Proponent shall describe the relevant components of the atmospheric environment within the study area of the VECs, including the following: – Climate and meteorology	10	10.2.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.4.4.1	28	– Indication of recent climate change observations	10	10.2.1.3
4.4.4.1	28	– Any emissions of greenhouse gases	10	10.2.1.4
4.4.4.1	28	– Existing ambient noise level	10	10.2.3
4.4.4.2 Aquatic Environment (Freshwater and Marine)	29	The Proponent shall describe the relevant components of the aquatic environment within the study area of the VECs, including the following: – Biological diversity	10	10.4, 10.5
4.4.4.2	29	– composition	10	10.4, 10.5
4.4.4.2	29	– abundance	10	10.4, 10.5
4.4.4.2	29	– distribution	10	10.4, 10.5
4.4.4.2	29	– population dynamics	10	10.4, 10.5
4.4.4.2	29	– sensitivity to disturbance and habitat utilization (including identification of sensitive/critical habitats) of aquatic species, including fish, semi-aquatic species, seabirds and marine mammals	10, Component Studies (Marine Environment)[c]	10.3.6, 10.4.5, 10.5.8, 10.5.9, 10.5.10
4.4.4.2	29	– Species of special interest or conservation concern (including their habitat), with an emphasis on rare, vulnerable or threatened species (e.g., species listed in the *Endangered Species Act*, *Species at Risk Act* as well as COSEWIC and Species Status Advisory Committee (SSAC) assessed species.)	10	10.4.6, 10.5.11
4.4.4.2	29	– Areas of special interest (Strait of Belle Isle is considered an ecologically and biologically significant area (EBSA) characterized by its significance for marine mammals.)	10	10.5.6, 10.5.7, 10.5.9
4.4.4.2	29	– Description of physical oceanography in the Strait of Belle Isle and characterization of the ice regime, including iceberg movement and distribution, groundings, and scour depth	10	10.5.2, 10.5.3, 10.5.4, 10.5.5
4.4.4.2	29	– Details re fish habitat classification and quantification	10	10.4.3, 10.5.8
4.4.4.2	29	– Fish mortality from Construction and Operations	13, 14	13.3.5, 13. 3.6, 14.2.5,14.2.6
4.4.4.2	29	– Human-environment interactions	16	Throughout

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.4.3 Terrestrial Environment	29	The Proponent shall describe the relevant components of the terrestrial environment within the study area of the VECs, including the following: – Relative abundance of species/systems to be included to assess potential impacts (looking both inside and outside of impacted area)	10	10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7
4.4.4.3	29	– Bedrock and surficial geology, terrain and soil conditions	10	10.3.1, 10.3.2
4.4.4.3	29	– Any permafrost conditions, including areas of discontinuous permafrost	10	10.3.2
4.4.4.3	29	– Species of special interest or conservation concern (including their habitat), with an emphasis on rare, vulnerable or threatened species (e.g.: species listed in the Endangered Species Act, Species at Risk Act as well as COSEWIC listed species and SSAC assessed species.)	10	10.3.3.3, 10.3.4.3, 10.3.6.3, 10.3.7.3
4.4.4.3	29	– Composition, abundance, distribution, population dynamics and habitat utilization of terrestrial fauna, including:	10	10.3.4, 10.3.5, 10.3.6, 10.3.7
4.4.4.3	29	– mammals	10	10.3.4, 10.3.5, 10.3.6
4.4.4.3	29	– avifauna (e.g., raptors and migratory birds including landbirds, rare fauna, waterfowl and shorebirds)	10	10.3.7
4.4.4.3	29	– fauna (including migratory species)	10	10.3.4, 10.3.5, 10.3.6, 10.3.7
4.4.4.3	29	– fauna species at risk	10	10.3.4.3, 10.3.6.3, 10.3.7.3
4.4.4.3	29	– and potential habitat for fauna species at risk	10	10.3.4.3, 10.3.6.3, 10.3.7.3
4.4.4.3	29	– Composition, distribution and abundance of terrestrial flora, including forest inventories and ecological land classifications. Flora (include lichens), including typical species, rare species, species at risk, non-native species and potential habitat for flora species at risk	10, Component Studies[c]	10.3.3.3
4.4.4.3	30	– Existing patterns of habitat and ecotype alteration, disruption and destruction i.e., document existing land uses with the objective of determining existing and projected footprint	10, 15, Component Studies[c]	10.3.3.3, 15.5

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.4.3	30	– Composition, distribution and abundance of medicinal herbs and plants harvested by affected Aboriginal communities. This should be based in whole or in part on information on importance and use of these herbs and plants as provided to Nalcor by Aboriginal communities	10, Component Studies[(c)]	10.3.3.2, 10.3.3.3
4.4.4.3	30	– Composition, distribution and abundance of wetlands as classified using the Canada Wetland Classification System	10, Component Studies[(c)]	10.3.3.2, 10.3.3.3
4.4.4.3	30	– Further characterization, in terms of a map with wetlands/wetland complexes identified and a table which gives the size and the dominant class of the identified wetlands	10	10.3.3.3
4.4.4.3	30	– A functional analysis (e.g., habitat, water flow regulation, groundwater recharge) shall be conducted only for those wetlands that are expected to be directly affected	12	12.2.5.4
4.4.4.3	30	– Migratory patterns/migratory wildlife river crossings	10	10.3.4.3
4.4.4.3	30	For the Terrestrial Environment some key indicator species/species assemblages were selected to focus the environmental assessment. The species selected are reflective of different phyla, orders, families or guilds of species that represent key components of the Terrestrial Environment. These species were selected as being representative of species groups, importance in the food web (e.g., top predator), and their importance from socio-cultural and economic perspectives. The following is the list of these key indicators:	10	10.3
		(a) Caribou	10	10.3.4
4.4.4.3	30	(b) Harlequin duck	10	10.3.7
4.4.4.3	30	(c) Waterfowl (including early and late breeding, molting and staging)	10	10.3.7
4.4.4.3	30	(d) Shorebirds	10	10.3.7
4.4.4.3	30	(e) Upland game birds (including Willow and Rock Ptarmigan)	10	10.3.7
4.4.4.3	30	(f) Raptors	10	10.3.7
4.4.4.3	30	(g) Landbirds (including passerine and song birds)	10	10.3.7
4.4.4.3	30	(h) Black Bear	10	10.3.5

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.4.3	30	(i) Moose	10	10.3.5
4.4.4.3	30	(j) Marten	10	10.3.6
4.4.4.3	30	(k) Lynx/Coyote/Wolves	10	10.3.6
4.4.4.3	30	(l) Flora species (Plants and Lichens)	10	10.3.3
4.4.4.4 Land and Resource Use	30	The Proponent shall describe relevant land and resource use within the study area of the VECs, including the following: – Present and potential timber resource logging/harvesting and utilization (commercial and domestic)	10, 15	10.3.3, 15.5.13
4.4.4.4	31	– existing roads	15	15.5.4
4.4.4.4	31	– transmission lines	1, 15	1.2, Figure 1.2-2, 15.8.4
4.4.4.4	31	– other linear features	15	15.5.4
4.4.4.4	31	– other developments	15	15.5.14
4.4.4.4	31	– and natural disturbances such as fire	10	10.3.3
4.4.4.4	31	– Current use of land and resources (including freshwater and marine aquatic resources) by Aboriginal persons for traditional purposes, including:	10, 15	Chapters 10, 15 under the 'Aboriginal Ecological Knowledge' headings
4.4.4.4	31	– location of camps	15	15.5.7
4.4.4.4	31	– harvested species	10, 15	10.3.3, 15.5.7
4.4.4.4	31	– and transportation routes	15	15.5.7
4.4.4.4	31	– Mapping in relation to Aboriginal land use shall include Aboriginal toponyms, where relevant and available to the Proponent, in addition to common and accepted local place names	15	15.5.7
4.4.4.4	31	– Current use of land and resources (including freshwater and marine aquatic resources) by other users (including agricultural, petroleum and mineral exploration, quarries, structural development such as cabins, outfitting camps, trapper's camps, etc.)	15	15.5, 15.6
4.4.4.4	31	– Other rural land and resource use including:	15	15.5

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.4.4.4	31	– existing and potential recreational and commercial fishing (freshwater and marine) and the fishing gear used	15	15.5.6, 15.5.8, 15.6
4.4.4.4	31	– hunting, gathering of country food	15	15.5.5, 15.5.7, 15.5.8
4.4.4.4	31	– and collection of plant propagules	15	15.5.7
4.4.4.4	31	– Current use of land and water resources for supply of domestic potable water for individuals and communities	15	15.5.3
4.4.4.4	31	– Current navigational use (e.g., vessel/boat traffic) and winter travel in areas of: – Electrodes – Sub sea cables	15	15.5.4
4.4.4.4	31	– temporary/permanent water crossings	15	15.5.4
4.4.4.4	31	– and any other works than are placed in, on, over, through, or across any navigable water	15	15.5.4
4.4.4.4	31	– Location and description of unique sites or special features, including: – any candidate sites for ecological or cultural heritage preservation and conservation	15	15.2.3, 15.2.4, 15.2.5, 15.5.12
4.4.4.4	31	– Environmentally Sensitive Areas	15	15.5.12
4.4.4.4	31	– reserves or protected areas	15	15.5.12
4.4.4.4	31	– conservation agreement lands	15	15.5.12
4.4.4.4	31	– and habitat enhancement projects	12	12.4.5, 12.6.1, 14.2.5.1, Table 12.6.1-1
4.4.4.4	31	– Landscapes, landscape integrity, aesthetics, wilderness values	15	15.5.12, 15.7, 15.8
4.4.4.5 Cultural Heritage Resources	31	The Proponent shall describe relevant cultural heritage resources in the study areas of the VECs, including: – Burial, cultural, spiritual and heritage sites	15	15.2, 15.5.7
4.4.4.5	31	– Historic and archaeological resources, including those underwater	15	15.2.3
4.4.4.5	31	– Palaeontological resources	15	15.2.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.4.5	31	– Architectural resources	15	15.2.5
4.4.4.6 Communities	31	The Proponent shall describe relevant community elements in the study areas of the VECs, including: – Demographics	15	15.3.4, 15.4.3
4.4.4.6	31	– Community services and infrastructure	15	15.3.5
4.4.4.6	31	– Health services and social programs (e.g., drug addiction, delinquency)	15	15.3.6
4.4.4.6	31	– Human health	15	15.3.6
4.4.4.6	32	– Drinking water sources and quality	15	15.3.5.4
4.4.4.6	32	– Community health	15	15.3.6
4.4.4.6	32	– Family life	15	15.3.6
4.4.4.6	32	– Safety	15	15.3.6
4.4.4.6	32	– Culture	15	15.3.6
4.4.4.6	32	– Education and Training	15	15.3.5.8
4.4.4.6	32	– Housing and accommodation	15	15.3.5.7
4.4.4.6	32	– Property value and land use	15	15.3.5.7
4.4.4.6	32	Mapping in relation to Aboriginal communities shall include Aboriginal toponyms, where relevant and available to the Proponent, in addition to common and accepted local place names.	15	15.5.7
4.4.4.7 Economy, Employment and Business	32	The Proponent shall describe relevant economy, employment and business elements in the study areas of the VEC, including: – Economy of the province	15	15.4.4
4.4.4.7	32	– Taxes and royalties	15	15.4.4
4.4.4.7	32	– Effects on gross domestic product	16	16.4
4.4.4.7	32	– Employment in the province	15	15.4.5
4.4.4.7	32	– Skilled and unskilled labour supply in the province	15	15.4.5

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.4.4.7	32	– Expenditures in the province	15	15.4.4
4.4.4.7	32	– Employment equity and diversity including under-represented groups (e.g., women, persons with disabilities, aboriginal groups)	15	15.4.5
4.4.4.7	32	– Business capacity	15	15.4.6
4.4.4.7	32	– Goods and services	15	15.4.4, 15.4.6
4.4.4.7	32	– Agriculture	15	15.5.15
4.4.4.7	32	– Outfitting	15	15.5.8
4.4.4.7	32	– Tourism	15	15.7
4.4.4.7	32	– Trapping	15	15.5.5
4.4.4.7	32	– Forest Resources Harvesting	15	15.5.7, 15.5.13
4.4.4.7	32	– Mining and Mineral Exploration	15	15.5.14
4.4.5 Component Studies	32	Component Studies shall be prepared for at least the following VECs, including: – Caribou (and predators)	10, Caribou and Their Predators CS; Caribou and Their Predators (Labrador and Newfoundland) Study – Revised CS	Referenced in 10.3.4
4.4.5	32	– Furbearers	10, Furbearers and Small Mammals CS	Referenced in 10.3.6
4.4.5	32	– Avifauna	10, Avifauna CS; Avifauna CS - Revised CS	Referenced in 10.3.7
4.4.5	32	– Species at risk (flora, including lichens and fauna)	10, Species of Special Conservation Concern CS	Referenced in 10.3.3

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.5	32	– Marine and Freshwater fish and fish habitat	10, 13, 14, Marine Environment: Fish and Fish Habitat, Water Resources CS	Referenced in 10.4. 5, 10.5.8, 13.2.4, 14.4.4
4.4.5	32	– Marine and Freshwater (quality and quantity)	10, Freshwater Resources: Fish and Fish Habitat, Water Resources CS	Referenced in 10.4.4, 10.5.7
4.4.5	33	– Historic resources	15, Historic and Heritage Resources CS	Referenced in 15.2.3, 15.2.4, 15.2.5
4.4.5	33	– Timber resources	10, Vegetation CS	Referenced in 10.3.3

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.4.5	33	– Socio-economics	15, Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation CS; Socioeconomic Environment: Aboriginal Communities and Land Use CS; Socioeconomic Environment: Marine Fisheries in the Strait of Belle Isle CS; Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation – Revised CS	Referenced in 15.2.2, 15.5.2, 15.6.2, 15.7.2, 15.8.2
4.4.5	33	– Viewscapes	15, 16, Viewscapes CS	Referenced in 15.5.8, 16.2.5, 16.5.4, 16.5.6, 16.8.1, 16.8.4, 16.8.7
4.4.5	33	Study outputs shall be proposed by the Proponent. Information and data generated shall be sufficient to adequately predict the effects on the VEC and determine monitoring and follow-up requirements.	10, 15, All Component Studies listed in cells above	Throughout chapters 10 and 15

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.4.6 Data Gaps	33	Any information gaps from a lack of previous research or practice shall be described indicating baseline/information which is not available or existing data which cannot accurately represent environmental conditions in the study area over four seasons.	6, 9, 11, 12, 13, 14, 16	6.5.3, 9.5.5; Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.4.6	33	If background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study area, modeling methods and equations shall be described and shall include calculations of margins of error and / or confidence limits.	Component Studies	Throughout
4.4.6	33	If data gaps remain, the Proponent shall describe its efforts to resolve the data gaps, including any direct consultation with groups, individuals and others.	6	6.5.3
4.4.7 Future Environment Without the Project	34	The EIS shall describe, to the extent possible, the predicted future condition of the environment within the expected life span of the Project, if the Project were not to proceed.	6	6.6
4.4.7	34	The predicted future condition of the environment shall help to distinguish project related effects from environmental change due to natural processes and shall include a discussion of climate change.	6	6.6.1
4.4.7	34	The socio-economic environment to be described will undergo change regardless of the Project.	6	6.6.5
4.4.7	34	The analysis shall consider the likely trends in the area in the absence of the Project given available information about other planned major projects or social, economic, or institutional changes in the zone of influence within the time frame of the Project.	6	6.6
4.5 Environmental Effects				
4.5.1 General	34	The EIS shall contain a comprehensive analysis of the predicted environmental effects on the VECs of each project alternative.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Evaluation of Project Alternatives' heading in each VEC section

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.1	34	If the effects are attributable to a particular phase of the Project (Construction, Operations and / or Maintenance) then they should be designated as such.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction', 'Operations and Maintenance' and 'Evaluation of Project Alternatives' headings in each VEC section
4.5.1	34	Predicted environmental effects (positive and negative, direct and indirect, short- and long-term) shall be defined quantitatively and qualitatively for each project alternative and for each VEC.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.5.1	34	Environmental effects predictions shall be explicitly stated and the theory or rationale upon which they are based shall be presented in terms of the following parameters, as appropriate (a) nature	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Environmental Effects Descriptors', 'Construction', 'Operations and Maintenance' and 'Environmental Effects Summary and Evaluation of Significance' headings in each VEC section
4.5.1	34	(b) magnitude (qualitative and quantitative)		
4.5.1	34	(c) geographic (spatial) extent		
4.5.1	34	(d) timing, duration and frequency		
4.5.1	34	(e) degree to which effects are reversible or mitigable		
4.5.1	34	(f) ecological context		
4.5.1	34	– Document the use of existing linear corridors by Newfoundland and Labrador caribou and their predators to provide baseline data on the effects of linear corridors on the landscape	10, 12	10.3.4.3, 12.3.5
4.5.1	34	– Identify the potential effects on remaining pristine areas and important habitat on the Northern Peninsula: the Highlands of St John and the Soufflets-Main River areas	15, 16	15.7, 15.8.4, 16.5.5.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.1	34	– Conduct botanical and wildlife surveys throughout the footprint of the proposed transmission line, as well as literature research detailing the effects of linear corridors on wildlife, and increased access and use by humans/predators	10, 12, Component Studies	Component Studies referenced in 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7; 12.2, 12.3, 12.4, 12.5 under the 'Existing Knowledge' heading in each VEC section
4.5.1	34	(g) Cultural heritage and social context	16	16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8
4.5.1	34	(h) level and degree of certainty of knowledge	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.5.1	35	(i) the capacity of renewable resources that are likely to be significantly affected by the Project, to meet the needs of present and future generations	11, 12, 13, 14, 16, 17	Chapters 11, 12, 13, 14, 16 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section and the 'Residual Project Effects and Significance' section for each chapter; 17.6.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.1	35	(j) the extent to which biological diversity is affected by the Project	12, 13, 14, 17	Chapters 12, 13, 14 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section and the 'Residual Project Effects and Significance' section for each chapter; 17.6.1.4
4.5.1	35	(k) environmental protection goals and objectives as set out in applicable legislation, regulations, policies, plans and programs	3, 11, 12, 13, 14, 16	3.6.1, 3.6.2, Appendix 3-1; Throughout chapters 11, 12, 13, 14, 16
4.5.1	35	The Proponent shall prepare a table describing the proposed Project's anticipated effects, which shall enable the reader to review and consider those effects.	11, 12, 13, 14, 16, 17	Chapters 11, 12, 13, 14, 16 in the 'Environmental Effects Analysis Summary' table in each VEC section; Table 17.5-1
4.5.1	35	Among the effects of the Project on the biophysical environment to be assessed, the EIS shall consider the effects on fish and fish habitat and marine mammals (including migration patterns and fish mortality), any greenhouse gas emissions and navigation and navigability. Climate change implications should also be considered.	11, 13, 14, 16	11.2.5, 11.2.6, 11.2.7, 11.3; 13.3.5, 13.3.6, 13.3.7; 13.4, 14.2.5, 14.2.6, 14.2.7, 14.3.5, 14.3.6, 14.3.7; 14.5, 16.6.5, 16.6.6, 16.6.7, 16.9
4.5.1	35	With respect to the fish and fish habitat VEC, the proponent shall conduct a comprehensive analysis of the impacts to fish and fish habitat, including marine mammals, associated with but not limited to: – installation and operation of the Strait of Belle Isle cable crossing, including any blasting activities	14	14.3.5

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.1	35	– acoustic outputs into the water, particularly for the Strait of Belle Isle, and its impact on marine mammals and their migration	14	14.3.5
4.5.1	35	– installation and operation of shore electrodes, including but not limited to electromagnetic and thermal fields, generated and induced electric fields and electrolysis products	14	14.2.6.3
4.5.1	35	– long-term effects of electrode functioning	14	14.2.6.3
4.5.1	35	– electromagnetic disturbances and their effects on fish and benthic invertebrates	14	14.2.6.3
4.5.1	35	– fate and effects of chlorine generated by electrodes	11	11.2.6.4, 14.2.6
4.5.1	35	– interference or disruptions to fisheries in the marine and freshwater environments, including the creation of access to remote lakes and rivers	13, 14	13.3.5, 13.3.6, 13.3.7; 14.2.5, 14.2.6, 14.2.7
4.5.1	35	– construction, operation and decommissioning of access roads and multiple watercourse crossings	13	13.3.5, 13.3.6
4.5.1	35	– Effects on fisheries and use of fishing gear in the Strait of Belle Isle as a result of the submarine cable	16	16.6.5, 16.6.6, 16.6.7
4.5.1	35	With respect to greenhouse gases, the Proponent shall describe and analyze any greenhouse gas emissions from the Project.	11	11.2.5.3, 11.2.6.3
4.5.1	35	With respect to effects of the Project on navigation and navigable waters, the Proponent shall describe effects on the navigability and the navigation patterns of all waters existing, altered or created by all phases (construction, installation, operation) of the Project.	16	16.6.5, 16.6.6, 16.6.7
4.5.1	35	Impacts on traditional (e.g., hunting, fishing) and current recreational and commercial waterway use should be identified and assessed.	16	16.5
4.5.1	35	The assessment of the beneficial and adverse effects of the Project on the socio-economic environment shall consider how the Project may affect various segments of the local populations (e.g., youth, elders, men, women, Aboriginal groups, harvesters, existing workforce including professionals). The following should be taken into account when assessing effects of the Project: (a) demographics	16	16.3.5.7, 16.3.6.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.1	36	(b) human health	16	16.3.5.6, 16.3.6.5
4.5.1	36	(c) social and cultural patterns	16	16.3.
4.5.1	36	(d) services and infrastructure (including road transportation of workers and materials)	16	16.3.5.3, 16.3.6.3
4.5.1	36	(e) cultural heritage sites	16	16.2
4.5.1	36	(f) land and resource use	16	16.5
4.5.1	36	(g) local, regional and provincial economy	16	16.4
4.5.1	36	(h) employment, education and training	16	16.4
4.5.1	36	(i) governments	16	16.4
4.5.1	36	(j) Aboriginal issues	7, 16	7.1, 7.2, 7.3, 7.4, 7.5, 16.5.7
4.5.1	36	(k) experience gained from previous large developments	16	Throughout
4.5.1	36	In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents, and how these are grounded in their culture, social organizations and historical experience.	8, 16	8.3, 8.4, 16.3, 16.5, 16.6, 16.7, 16.8
4.5.2 Accidents and Malfunctions	36	The Proponent will identify and describe the potential accidents and malfunctions related to the Project, including an explanation of how those events were identified	5	5.1, 5.3
4.5.2	36	potential consequences (including the potential environmental effects)	5	5.4 to 5.14
4.5.2	36	the worst case scenarios	5	5.4 to 5.14
4.5.2	36	and the effects of these scenarios	5	5.4 to 5.14
4.5.2	36	The Proponent will explain the potential quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the malfunction and accident events.	5	5.6, 5.7, 5.11

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.5.2	36	Potential accidents and malfunctions may include those associated with the following occurrences: – fires	5	5.9, 5.10
4.5.2	36	– waste management and disposal	5	5.11
4.5.2	36	– use, handling or spills of chemicals and hazardous materials on land or in the marine and freshwater environments, including vessel operations	5	5.6
4.5.2	36	– any other project components or systems that have the potential, through accident or malfunction, to adversely affect the natural environment	5	5.4 to 5.14
4.5.2	36	The Proponent shall pay special attention to the sensitive elements of the environment (e.g., communities, homes, natural sites of interest, areas of major use) that may be affected in the event of an accident or a major malfunction.	16	16.2, 16.3, 16.5, 16.6, 16.8, 16.9.2
4.5.2	36	The Proponent shall assess the likelihood of occurrence of the accidents and malfunctions.	5	5.4 to 5.14
4.5.2	36	Detailed plans, measures and systems to reduce the potential occurrence of an accident or malfunction shall be provided by the Proponent. They shall indicate how they will reduce the effects or consequences of an accident or malfunction, should it occur.	5	5.4 to 5.14
4.5.3 Cumulative Effects	37	The Proponent shall identify and assess the Project's cumulative environmental effects.	9, 11, 12, 13, 14, 16	9.3.9; Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section; 11.3.4, 12.6.5, 13.4.5, 14.5.5, 16.9.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.3	37	In the cumulative effects assessment, the Proponent shall consider guidance provided by the CEA Agency in its Cumulative Effects Assessment Practitioners Guide (1999) and other literature and experience with environmental assessment in Canada or elsewhere that it finds helpful in framing the cumulative environmental effects analysis.	9, 11, 12, 13, 14, 16	9.3.9; Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section; 11.3.4, 12.6.5, 13.4.5, 14.5.5, 16.9.4
4.5.3	37	The Proponent shall: – Identify and justify the VECs that will constitute the focus of the cumulative effects assessment. The Proponent's assessment should examine the likelihood, nature and extent of the predicted cumulative effects of each Project alternative for each VEC. It may be appropriate, during the course of the environmental assessment, to refine the definition of VECs selected for cumulative effects assessment.	11, 12, 13, 14, 16	9.2, 9.3, 11.2.9, 12.2.9, 12.3.9, 12.4.8, 12.5.9, 13.2.9, 13.3.9, 14.2.9, 14.3.9, 14.4.9, 16.2.9, 16.3.9, 16.4.9, 16.5.9, 16.6.8, 16.7.9, 16.8.10
4.5.3	37	– Present a justification for the spatial and temporal boundaries of the cumulative effects assessment. The boundaries for the cumulative effects assessments will again depend on the effects being considered (e.g., will generally be different for different effects). These cumulative effects boundaries will also generally be different from (larger than) the boundaries for the corresponding Project effects.	9, 11, 12, 13, 14, 16	9.3.9; Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section
4.5.3	37	– Describe and justify the choice of projects and selected activities for the cumulative effects assessment. These shall include past activities and projects, those being carried out and future projects or activities likely to be carried out. This shall include a discussion of cumulative environmental effects associated with any future increase in capacity of the Transmission Link to enable transportation of additional power from the Lower Churchill along all or part of the proposed transmission line.	9, 11, 12, 13, 14, 16	9.3.9; Table 9.3.9-2, Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section; 11.3.4, 12.6.5, 13.4.5, 14.5.5, 16.9.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.5.3	37	– Describe the mitigation measures that are technically and economically feasible.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section; 11.3.1, 12.6.1, 13.4.1, 14.5.1, 16.9.1
4.5.3	37	– Determine the significance of the residual cumulative effects.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Cumulative Effects Assessment' heading in each VEC section; 11.3.4, 12.6.5, 13.4.5, 14.5.5, 16.9.4
4.5.3	37	– Assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the Proponent's responsibility that could be effectively applied to mitigate these effects, the Proponent shall identify these effects and the parties that have the authority to act. In such cases, the Proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures over the long-term.	12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under the 'Construction' and 'Operations and Maintenance' headings in each VEC section; 11.3.1, 12.6.1, 13.4.1, 14.5.1, 16.9.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.5.4 Renewable Resources	37	The Proponent shall determine, based on the results of their assessment, whether the Project is likely to cause significant environmental effects on renewable resources.	12, 13, 14, 16, 17	Chapters 12, 13, 14, 16 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section, and the 'Residual Project Effects and Significance' heading in the 'Environmental Assessment Summary' section for each chapter; 17.6.2
4.5.4	38	The Proponent shall briefly describe the renewable resources that may be affected by the Project.	10, 15	Throughout
4.5.4	38	The Proponent shall clearly establish, taking into account the result of their impact assessment, whether these renewable resources are likely to be significantly affected following the implementation of proposed mitigation measures (residual significant environmental effects).	12, 13, 14, 16, 17	Chapters 12, 13, 14, 16 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section, and the 'Residual Project Effects and Significance' heading in the 'Environmental Assessment Summary' section for each chapter; 17.6.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.5.4	38	Should this be the case, the following points shall be addressed: – a brief description of the Project's environmental effects on the renewable resource	12, 13, 14, 17	Chapters 12, 13, 14 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section; 12.6.1, 13.4.1, 14.5.1, 17.6.2
4.5.4	38	– an indication as to the way in which the capacity of this resource was measured or evaluated	12, 13, 14	Chapters 12, 13, 14 under the 'Approach to the Environmental Effects Analysis' heading in each VEC section
4.5.4	38	– an indication of the temporal and geographic boundaries used to assess the capacity of the affected resource	12, 13, 14	Chapters 12, 13, 14 under the 'Environmental Assessment Study Areas' heading in each VEC section
4.5.4	38	– a determination of the capacity of the resource to meet current needs	17	17.6.2
4.5.4	38	– a description of any other appropriate mitigation measures	12, 13, 14	Chapters 12, 13, 14 under the 'Construction' and 'Operations and Maintenance' heading in each VEC section; 12.6.1, 13.4.1, 14.5.1
4.5.4	38	– a determination of the significance of the residual effects on the renewable resource and its capacity to meet the need of current and future generations	12, 13, 14, 17	Chapters 12, 13, 14 under the 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section; 17.6.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.5.4	38	– an identification of the risks and uncertainties that remain and the description of the next steps, if any, that will be required to address this effect	12, 13, 14, 17	Chapters 12, 13, 14 under the 'Environmental Effects Summary and Evaluation of Significance' and 'Monitoring and Follow-up' headings in each VEC section; 17.6.2, 17.7
4.5.5 Effects of the Environment on the Project	38	The environmental effects that may occur as a result of the environment acting on the Project shall be assessed.	4	4.1, 4.2, 4.3
4.5.5	38	Environmental changes and hazards that may occur and may affect the Project shall be described (e.g., wind, currents, waves, storm surges, severe precipitation events, flooding, ice, sea ice, icebergs, earthquakes).	4	4.1, 4.2, 4.3
4.5.5	38	The EIS shall take into account the potential influence of climate change scenarios (e.g., sea level rise, iceberg frequency, increased severity and frequency of storms and flooding).	4	4.1.11
4.5.5	38	The influence that these environmental changes and hazards may have on the Project shall be predicted and described.	4	4.1, 4.2, 4.3

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.6 Environmental Protection				
4.6.1 Mitigation	38	The EIS shall identify and discuss the proposed mitigation measures that are technically and economically feasible and that would mitigate the significant adverse effects of the Project and enhance beneficial effects, including the interaction of these measures with existing environmental management plans.	2, 11, 12, 13, 14, 16	2.14.2; Chapters 11, 12, 13, 14, 16 under 'Construction', 'Operations and Maintenance' and Monitoring and 'Follow-up' headings in each VEC section and chapter and under the 'Effects Management Measures' heading in the 'Environmental Assessment Summary' for each chapter
4.6.1	39	The rationale for and effectiveness of the proposed mitigation and enhancement measures should be discussed and evaluated. Available data, survey and study results and detailed monitoring and mitigation measures that demonstrate a particular emphasis on avoidance of environmental effects is to be included in the EIS.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Construction', 'Operations and Maintenance' and Monitoring and 'Follow-up' headings in each VEC section and chapter and under the 'Effects Management Measures' heading in the 'Environmental Assessment Summary' for each chapter

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.6.1	39	The Proponent, where possible, should refer to similar situations where the proposed mitigation has proven to be successful.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Existing Knowledge', 'Construction' and 'Operations and Maintenance' headings in each VEC section and chapter
4.6.1	39	Mitigation failure should be discussed with respect to risk and severity of consequence.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Existing Knowledge', 'Construction' and 'Operations and Maintenance' headings in each VEC section and chapter
4.6.1	39	The Proponent shall identify who is responsible for the implementation of these measures and the system of accountability, including the obligations of all its contractors and subcontractors.	3	3.6.1, 3.6.2, 3.6.3, Appendix 3-3
4.6.1	39	Mitigation measures shall be described for the Construction, Operations, Maintenance and decommissioning phases and shall include: (a) Procedures that would be used to avoid environmentally sensitive areas or periods of the year	12, 13, 14, 16	Chapters 12, 13, 14, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section
4.6.1	39	(b) Contingency plans and procedures to respond to accidents, malfunctions & emergencies	5, 11, 12, 13, 14, 16	5.2, 5.4 to 5.14; Chapters 11, 12, 13, 14, 16 under the 'Accidents and Malfunctions' heading in each chapter
4.6.1	39	(c) Description of fish habitat compensation measures to offset adverse effects on fish and fish habitat	14	14.2.5.1, 14.5.1, Table 14.5.1-1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.6.1	39	(d) Mitigation measures to reduce, eliminate or control impacts of project components and activities, identified in sections 4.3.4 Construction, 4.3.5 Operations and Maintenance and 4.3.6 Decommissioning, on fish and fish habitat (including marine mammals)	13, 14	13.3.5, 13.3.6, 13.4.1, 14.2.5, 14.2.6, 14.5.1
4.6.1	39	(e) Measures to ensure continued unrestricted and safe access and passage on land and sea for harvesting and travel by Aboriginal and non-Aboriginal local residents, and what alternatives shall be provided in the event of disruption	16	16.5.5, 16.5.6, 16.5.7, 16.9.1
4.6.1	39	(f) Measures to reduce or eliminate impacts on safe navigation during the construction, installation, and operation of the subsea cable crossing, electrode sites, temporary and permanent stream crossings, and all aerial transmission lines over navigable waters	16	16.6.5, 16.6.6, 16.6.7, 16.9.1
4.6.1	39	(g) Mitigation measures which would be taken to reduce or offset adverse effects on communities affected by the Project	16	16.3.5, 16.3.6, 16.3.7, 16.9.1
4.6.1	39	(h) Mitigation measures which would be taken to reduce or offset adverse effects on local businesses most directly affected by the Project	16	16.4.5.5, 16.4.6.5, 16.9.1
4.6.1	39	(i) Measures to enhance any beneficial environmental effects, such as economic benefits to businesses affected by the Project	16	16.4.5.5, 16.4.6.5, 16.9.1
4.6.1	39	(j) Measures to maximize labour market opportunities, including Aboriginal labour, and address labour challenges with an emphasis on strategies to enhance recruitment and retention and increase employment and participation. To this end, the Proponent must minimally describe a human resources plan that includes a description of objectives and strategies to address labour force availability, skilled trades recruitment, diversity in recruitment, training and employment equity. This plan should also minimally identify employment objectives and targets for women and other labour force groups if applicable	16	2.14.4, 16.4
4.6.1	40	(k) Contingency plans and procedures to follow in the event cultural heritage resources are accidentally discovered during all phases of the project	16	16.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.6.1	40	(l) Development and methods for implementing wildlife (fauna and flora) mitigation protocols and associated monitoring programs. Issues surrounding increased access and potential effects on wildlife and species at risk, must be considered	12, 13, 14	Chapters 12, 13, 14 under 'Construction', 'Operations and Maintenance' and 'Monitoring and Follow-up' headings in each VEC section
4.6.1	40	Other mitigation measures that were considered, if any, shall be identified, and the rationale for rejecting these measures shall be explained.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section and 'Environmental Assessment Summary' in each chapter
4.6.1	40	Trade-offs between costs and predicted effectiveness of the mitigation measures shall be justified.	9	9.5.5
4.6.1	40	The Proponent shall discuss the application of the Precautionary Principle in the identification of mitigation measures. The Precautionary Principle is defined in Section 2.5.	9	9.5.5
4.6.1	40	The best available technology and best management practices shall be considered.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section and 'Environmental Assessment Summary' in each chapter

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.6.1	40	Consideration shall be given for avoidance of environmental effects through implementation of scheduling and siting constraints and pollution prevention opportunities.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Construction' and 'Operations and Maintenance' headings in each VEC section and 'Environmental Assessment Summary' in each chapter
4.6.1.1 Compensation	40	The Proponent shall describe, in general terms, compensation programs and arrangements as follows: (a) Any compensation programs for damage caused by the Proponent's activities to the environment, to property, business operations, or to the land and resources of others. The Proponent shall describe any existing or proposed compensation programs for losses relating to property, use, access, harvests, added harvesting effort and costs that may be incurred by users of the land and its resource (e.g., tourism operators, outfitters, trappers, subsistence hunters). A comparison with compensation programs for other projects and other resource development activities shall be provided	16	16.5.5.1, 16.6.5.1, 16.6.6.1
4.6.1.1	40	(b) Any compensation arrangements for local, public or private providers whose burdens and costs are increased or who incur losses as a result of the Project	16	16.5.5.1, 16.6.5.1, 16.6.6.1
4.6.2 Emergency Response / Contingency Plans	40	The Proponent shall describe its environmental management plans which shall include consideration of human-wildlife interaction (e.g., bear management plans) and Safety, Health and Environmental Emergency Response Plans (SHERP) to provide an overall perspective on how potentially adverse environmental effects shall be managed over time.	2, 3, 5	2.14.2, 2.14.3, 3.6.1, 3.6.2, Appendix 3-3, 5.6.1

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.6.2	40	The Environmental Management System (EMS) shall include various plans (e.g., emergency response plans, contingency plans, environmental protection plans, waste management plans (shall consider issues with bears near camps, use of bear proof waste material containers, etc.), hazardous spill plans, monitoring plans) and developed in a manner consistent with the International Organization for Standardization (ISO) 14001 program.	2, 3	2.14.1, 3.6
4.6.2	41	It shall show how the Project is consistent with sustainable development efforts in the region.	9, 17	9.5.4; Throughout Chapter 17
4.6.2	41	Appropriate government agencies, Aboriginal groups and local communities shall be involved in the development of the plans.	7, 8	7.1, 8.1, 8.3
4.6.3 Rehabilitation	41	A plan of proposed rehabilitation measures is required to address areas disturbed by temporary activities such as access roads, off-loading facilities, construction camp(s), land clearing etc.	3	3.4.3.6, 3.4.6.5
4.6.3	41	The plan shall discuss the rationale, objectives and procedures for proposed rehabilitation measures.	3	3.6.1
4.6.3	41	A schedule for carrying out the work (e.g., seasonal requirements) shall be included in the plan.	3	3.4.3.6, 3.4.6.5
4.6.3	41	Appropriate materials (e.g., plant species, soils) shall be indicated.	3	3.6.1
4.6.4 Monitoring and Follow-up Programs	41	The EIS shall describe the environmental and socio-economic monitoring and follow-up programs to be incorporated into Construction, Operations and modification activities.	9, 11, 12, 13, 14, 16	9.4.6; Chapters 11, 12, 13, 14, 16 under ‘Monitoring and Follow-up’ heading in each VEC section and ‘Environmental Assessment Summary’ in each chapter

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[(a)] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.6.4	41	The purpose of the follow-up program is to verify the accuracy of the predictions made in the assessment of the effects as well as the effectiveness of the mitigation measures. The duration of the follow-up program shall be as long as is needed to evaluate the effectiveness of the mitigation measures.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Monitoring and Follow-up' heading in each VEC section and 'Environmental Assessment Summary' in each chapter
4.6.4	41	The Proponent shall consider guidance provided by the Canadian Environmental Assessment Agency in its follow-up programs under the *Canadian Environmental Assessment Act*.	11, 12, 13, 14, 16, 17	Chapters 11, 12, 13, 14, 16 under 'Monitoring and Follow-up' heading in each VEC section and 'Environmental Assessment Summary' in each chapter; 17.8
4.6.4	41	The proponent shall report on hiring and employment objectives and targets on a quarterly basis.	16	16.4.10
4.6.4	41	If either of these programs identify unforeseen adverse environmental effects, the Proponent shall commit to adjusting existing mitigation measures, or, if necessary, develop new mitigation or compensation measures.	9	9.4.6, 9.5.5
4.6.4	42	The Proponent shall describe how the results of monitoring and follow-up programs will be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations.	9	9.4.6, 9.5.5
4.6.4	42	This section shall also discuss the ways in which holders of Aboriginal traditional and community knowledge, including elders, women and youth, shall be involved in any monitoring and follow-up programs.	9	9.4.6
4.6.4	42	The Proponent shall distinguish as appropriate between monitoring (compliance) and effects follow-up programs.	9	9.4.6
4.6.4	42	The proposed approach for monitoring shall be described and shall include: (a) The objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives	9	9.4.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.6.4	42	(b) The sampling design, methodology, selection of the subjects and indicators to be monitored, and their selection criteria	9	9.4.6
4.6.4	42	(c) The frequency, duration and geographic extent of monitoring, and justification for the extent	9	9.4.6
4.6.4	42	(d) The application of the principles of Adaptive Environmental Management	9	9.4.6
4.6.4	42	(e) Reporting and response mechanisms, including criteria for initiating a response and procedures	9	9.4.6
4.6.4	42	(f) The approaches and methods for monitoring the cumulative effects of the Project with existing and future developments in the Project area	9	9.4.6
4.6.4	42	(g) Integration of monitoring results with other aspects of the Project including adjustments to operating procedures and refinement of mitigation measures	9	9.4.6
4.6.4	42	(h) Experience gained from previous and existing monitoring programs	9	9.4.6
4.6.4	42	(i) The advisory roles of independent experts, government agencies, communities, holders of Aboriginal traditional and community knowledge and renewable resource users	9	9.4.6
4.6.4	42	(j) Procedures to assess the effectiveness of monitoring and follow-up programs, mitigation measures and recovery programs for areas disturbed by the Project	9	9.4.6
4.6.4	42	(k) A communications plan to describe the results of monitoring to interested parties.	9	9.4.6
4.6.4	42	The Proponent shall explain how the public and Aboriginal groups shall continue to be involved, including participation in the design and implementation of environmental management and monitoring and follow-up programs.	9	9.4.6

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.6.4	42	The Proponent shall describe plans to maintain communications and working relationships with the affected communities, Aboriginal organizations, municipalities and government agencies throughout the life of the Project. The intent of these plans is to involve those groups in monitoring and follow-up programs, and in identifying and working toward the reduction of adverse physical, biological or socio-economic effects, and the enhancement of beneficial effects.	7, 8, 9, 16	7.1, 9.4.6; Throughout Chapter 16; 16.9.1, Tables 16.9.1-1 and 16.9.1-2
4.6.4	43	To design complete and comprehensive program proposals, the Proponent shall prepare and submit these documents subsequent to the completion of the environmental assessment, but before the initiation of the Project itself.	9	9.4.6
4.7 Residual Effects and Determination of Significance	43	Residual effects are those adverse environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies, best management practices or other acceptable means. The EIS shall list and contain a detailed discussion and evaluation of residual effects, including residual cumulative effects, which shall be defined in terms of the parameters outlined in sections 4.5.1 and 4.5.3.	11, 12, 13, 14, 16	Chapters 11, 12, 13, 14, 16 under 'Construction', 'Operations and Maintenance', 'Environmental Effects Summary and Evaluation of Significance' and 'Cumulative Effects Assessment' headings in each VEC section and 'Environmental Assessment Summary' in each chapter

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	**Page**		**Chapter(s)**	**Section(s)**
4.7	43	The EIS shall contain a concise statement and rationale for the overall conclusion relating to the significance of the residual adverse environmental effects. The EIS will, for ease of review, include a summary table of the environmental effects, proposed mitigation and residual adverse effects.	11, 12, 13, 14, 16, 17	Chapters 11, 12, 13, 14, 16 under 'Environmental Effects Summary and Evaluation of Significance' heading in each VEC section and 'Environmental Assessment Summary' in each chapter; 17.5, Table 17.5-1
4.8 Consultation With Aboriginal Groups and Communities	43	The EIS shall demonstrate the Proponent's understanding of the interests, values, concerns, contemporary and historic activities, Aboriginal traditional knowledge and important issues facing Aboriginal groups, and indicate how these will be considered in planning and carrying out the Project.	7	7.2, 7.3, 7.4, 7.5 and associated issues and issues concordance tables
4.8	43	The Aboriginal groups and communities to be considered include, in Newfoundland and Labrador, the Innu Nation, the NunatuKavut Community Council and the Nunatsiavut Government and, in Québec, the Innu communities of Uashat Mak Mani-Utenam, Ekuanitshit, Nutaskuan, Unamen Shipu, Pakuashipi, Matimekush-Lac John, and the Naskapi Nation of Kawawachikamach.	7	7.1, 7.3, 7.4, 7.5
4.8	43	The Proponent should offer consultation/information meetings with each of the above-mentioned Aboriginal groups.	7	7.1, 7.3, 7.4, 7.5
4.8	43	The Proponent should communicate with the above mentioned Aboriginal groups to offer oral presentations in Aboriginal communities.	7	7.1, 7.3, 7.4, 7.5
4.8	43	The Proponent shall also offer to provide simultaneous translation of the oral presentations in the Aboriginal language spoken in the particular Aboriginal community.	7	7.1
4.8	43	Presentations should describe the project, its predicted impacts and their significance, and proposed mitigation measures.	7, Plain Language Summary	7.1, 7.2

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.8	43	To assist in ensuring that the EIS provides the necessary information to address issues of potential concern to these groups, the Proponent shall consult with each group for the purpose of: – familiarizing the group with the Project and its potential environmental effects	7, Plain Language Summary	7.2, 7.3, 7.4, 7.5
4.8	43	– identifying any issues of concern regarding potential environmental effects of the Project	7, Plain Language Summary	7.2, 7.3, 7.4, 7.5
4.8	43	– identifying what actions the Proponent is proposing to take to address each issue identified, as appropriate	7, Plain Language Summary	7.2, 7.3, 7.4, 7.5
4.8	43	The Proponent shall explain in the EIS the process undertaken to understand the interests, values, concerns, contemporary and historic activities, Aboriginal traditional knowledge and important issues facing Aboriginal groups including any meetings, presentations and consultations held with the above-mentioned Aboriginal groups and communities including any oral or written translation and interpretation in Aboriginal languages.	7, Plain Language Summary	7.1, 7.3, 7.4, 7.5
4.8	44	If the Proponent is not able or should not address any particular issue(s), the EIS should include supporting reasons.	7	7.2, 7.3, 7.4, 7.5
4.8	44	The results of those consultations are to be presented in a separate chapter of the EIS with an individual section for each of the affected Aboriginal groups. The Proponent must refer readers to the relevant sections of the EIS, as appropriate.	7	7.2, 7.3, 7.4, 7.5
4.9 Public Participation	44	Public consultation meetings are required of the Proponent to present the proposal and to record interests and concerns, including those received in response to the Registration. These concerns shall be addressed in a separate chapter of the EIS.	8	8.3, 8.4, Tables 8.1-1, 8.3.1-1 and 8.4-1
4.9	44	The Proponent shall describe the activities and information sessions that they will hold or that they have already held within the context of the Project at the local, regional and national levels, where applicable.	8	8.3, 8.4

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.9	44	The Proponent shall indicate the methods used and their relevance, the locations where information sessions were held, the persons and organizations attending, the concerns voiced and the extent to which this information was incorporated in the design of the Project as well as in the EIS.	8	8.3, 8.4, Tables 8.3.1-1, 8.3.2-1 to 8.3.2-6 and 8.4-1
4.9	44	Moreover, the Proponent shall describe how issues were recorded and addressed through the use of tables of concordance. Any outstanding issues shall be clearly identified.	8	Table 8.4-1
4.9	44	Protocol for this meeting shall comply with the legislation and with the Newfoundland and Labrador Department of Environment and Conservation's Environmental Assessment Division's policy on advertisement requirements for public meetings/information sessions included in Appendix B.	8	8.3.2
4.9	44	As a minimum, public meetings in Labrador must be held in the communities, of Happy Valley-Goose Bay, Northwest River, Sheshatshiu and Forteau. On the Island portion of the province meetings must be held in, or at locations easily accessible to, the communities of Flower's Cove, Portland Creek, Deer Lake, Grand Falls, Clarenville, Holyrood and St. John's.	8	8.3.1, Table 8.3.1-1, 8.3.2
4.10 Environmental Protection Plan	44	The Proponent shall prepare an Environmental Protection Plan (EPP) for each main construction site and have them approved by the regulatory authorities before starting construction. They shall be stand-alone documents that shall target the site foreperson, the Proponent's occupational health, safety and environmental compliance staff, as well as government environmental surveillance staff.	2, 3, 17	2.14.2, 3.6.1, Appendix 3-3, Table 17.4-1
4.10	44	The EPPs shall address Construction, Operations and modification phases of the Project.	2, 3	2.14.2, 3.6.1, Appendix 3-3
4.10	44	A proposed Table of Contents and an annotated outline for the EPPs is to be presented in the EIS which shall address the major construction and operational activities, permit requirements, mitigation measures and contingency planning as follows:	3, 17	3.6, Appendix 3-3, Table 17.4-1
	44	– Proponent's environmental policies	3	3.6.1, Appendix 3-4
4.10	45	– Objectives and voluntary commitments	3	3.6.1, Appendix 3-3

Table 8-1.1 Table of Concordance with EIS Guidelines and Scoping Document (continued)

EIS Guidelines[a] Section		Relevant Items	EIS Location(s)	
Section	Page		Chapter(s)	Section(s)
4.10	45	– Relevant human resource management plans	3	3.6.1, Appendix 3-3
4.10	45	– Environmental compliance monitoring	3	3.6.1, 3.6.3, Appendix 3-3
4.10	45	– Environmental protection measures	3	3.6.1, Appendix 3-3
4.10	45	– Mitigation measures	3	3.6.1, Appendix 3-3
4.10	45	– Permit application and approval planning	3	3.6.1, Appendix 3-3
4.10	45	– Contingency planning for accidental and unplanned events	3	3.6.1, 3.6.2, Appendix 3-3
4.10	45	– Statutory requirements	3	3.6.1, Appendix 3-3
4.10	45	– Revision procedures and contact lists	3	3.6.1, Appendix 3-3
4.11 Commitments Made in EIS	45	Provide a list of all commitments made in the Environmental Impact Statement regarding environmental mitigation, monitoring and follow-up. Included in the list is a reference to the section of the EIS where the commitment(s) are made.	17	17.4, Table 17.4-1
4.12 References Cited	45	All references used during the preparation of the EIS shall be cited in the text and listed in this section.	All chapters	'References' section
4.13 Personnel	45	The names and qualifications of all key professionals responsible for preparing the EIS and supporting documentation shall be included.	Preface	—
4.14 Copies of Reports	45	The Proponent shall prepare a complete and detailed bibliography of all studies used to prepare the EIS. Supporting documentation shall be referenced in the EIS and submitted in separate volumes or attached as an Appendix to the EIS.	Chapter 1 to 17, Component Studies	'References' within the EIS chapters, Component Studies

[a] Source: Government of Newfoundland and Labrador and Government of Canada. 2011b. Environmental Impact Statement Guidelines and Scoping Document, Labrador-Island Transmission Link. Prepared for Nalcor. St. John's, NL.

[b] Nalcor has addressed this guideline through its comprehensive public consultation program, for which Nalcor developed a suite of support material designed to assist the public in understanding the Project. Nalcor produced brochures, information sheets, a Project website, illustrations and diagrams, power point presentations, newsletters, and physical models. In addition, Nalcor representatives used these visual aids at public information sessions to directly respond to questions and better explain the Project.

[c] Descriptions of the existing biophysical and socioeconomic environments are also provided in the Component Studies submitted as part of the environmental assessment process for the Project.

NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 9

Environmental Assessment Approach and Methodology

April 2012

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SECTION **PAGE**

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LIST OF ACRONYMS

Acronym	**Description**
CEAA	*Canadian Environmental Assessment Act*
EA	Environmental Assessment
EIS	Environmental Impact Statement
KI	Key Indicator
LSA	Local Study Area
MP	Measurable Parameter
NLEPA	*Newfoundland and Labrador Environmental Protection Act*
ROW	right-of-way
RSA	Regional Study Area
VECs	Valued Environmental Components
Project	Labrador-Island Transmission Link Project

9 ENVIRONMENTAL ASSESSMENT APPROACH AND METHODOLOGY

This Environmental Impact Statement (EIS) has been developed and submitted by Nalcor Energy (Nalcor) in accordance with the requirements of the provincial Newfoundland and Labrador *Environmental Protection Act* (*NLEPA*) and federal *Canadian Environmental Assessment Act* (*CEAA*) environmental assessment (EA) legislation and associated regulations, and the *Environmental Impact Statement Guidelines and Scoping Document* issued to Nalcor by the provincial and federal governments in May 2011 (Government of Newfoundland and Labrador and Government of Canada 2011).

The following Chapter describes the EA approach and methodology that has been used to conduct the environmental effects assessment reported in this EIS, including each of its key stages and components (Figure 9-1). The methods used are in keeping with current EA approaches and best practice, and have been developed and used to help ensure a thorough and rigorous analysis, while at the same time presenting the results of the EA in a clear, concise and well-organized manner.

9.1 Project Description and Existing Environment

A detailed description of the proposed Nalcor Labrador-Island Transmission Link (Project) is provided earlier in the EIS (Chapter 3), including its location, key components and overall layout, planned Construction, and Operations and Maintenance phases, labour force requirements, expenditures and schedule.

The existing natural and human environments in the general area of the Project were subsequently discussed in Chapter 6 (Environmental Setting and Context) and are described in more detail in Chapters 10 (Existing Biophysical Environment) and 15 (Existing Socioeconomic Environment). Aboriginal traditional knowledge and community knowledge of the existing environment has been integrally included in this EIS.

The environmental effects assessment aspect of this EIS involves predicting and evaluating the likely environmental effects of the Project, which are generally defined as changes that the Project is likely to cause in the environment. The assessment of potential environmental effects in an EA is therefore generally based on the approach of “overlaying” a proposed project over its existing environment, so as to identify and describe whether, how, and to what degree components of the environment are likely to change as a result (Figure 9-1).

In this EIS, the environmental effects assessment is organized by general “environment”, with separate chapters presenting the analysis for the Atmospheric Environment (Chapter 11), Terrestrial Environment (Chapter 12), Freshwater Environment (Chapter 13), Marine Environment (Chapter 14), and Socioeconomic Environment (Chapter 16).

9.2 Valued Environmental Component Selection

In keeping with what has become standard EA practice, and as specified in the EIS Guidelines and Scoping Document, this EA is organized by and focussed on a series of identified Valued Environmental Components (VECs).

VECs are aspects of the biophysical and socioeconomic environments which are of particular ecological and / or social importance, and which will likely be affected (adversely or positively) by the proposed project under assessment. VECs reflect identified scientific and community concerns regarding a project and its potential effects, and are typically identified early in an EA as a result of questions and issues raised through consultations with government departments and agencies, Aboriginal and stakeholder groups and the interested public. The VEC approach is a useful, effective and widely accepted way of helping to ensure that an EA focuses early and throughout on important environmental components and issues.

Initial direction and input into VEC selection were obtained through the EIS Guidelines and Scoping Document issued to Nalcor by the provincial and federal governments in May 2011 following review and input by Aboriginal groups and then the public. Following further consideration and analysis by the EIS study team and as a result of Nalcor’s own extensive consultation activities, that initial list of VECs has been expanded and refined to include and reflect the key environmental components and issues that require detailed consideration in the EIS.

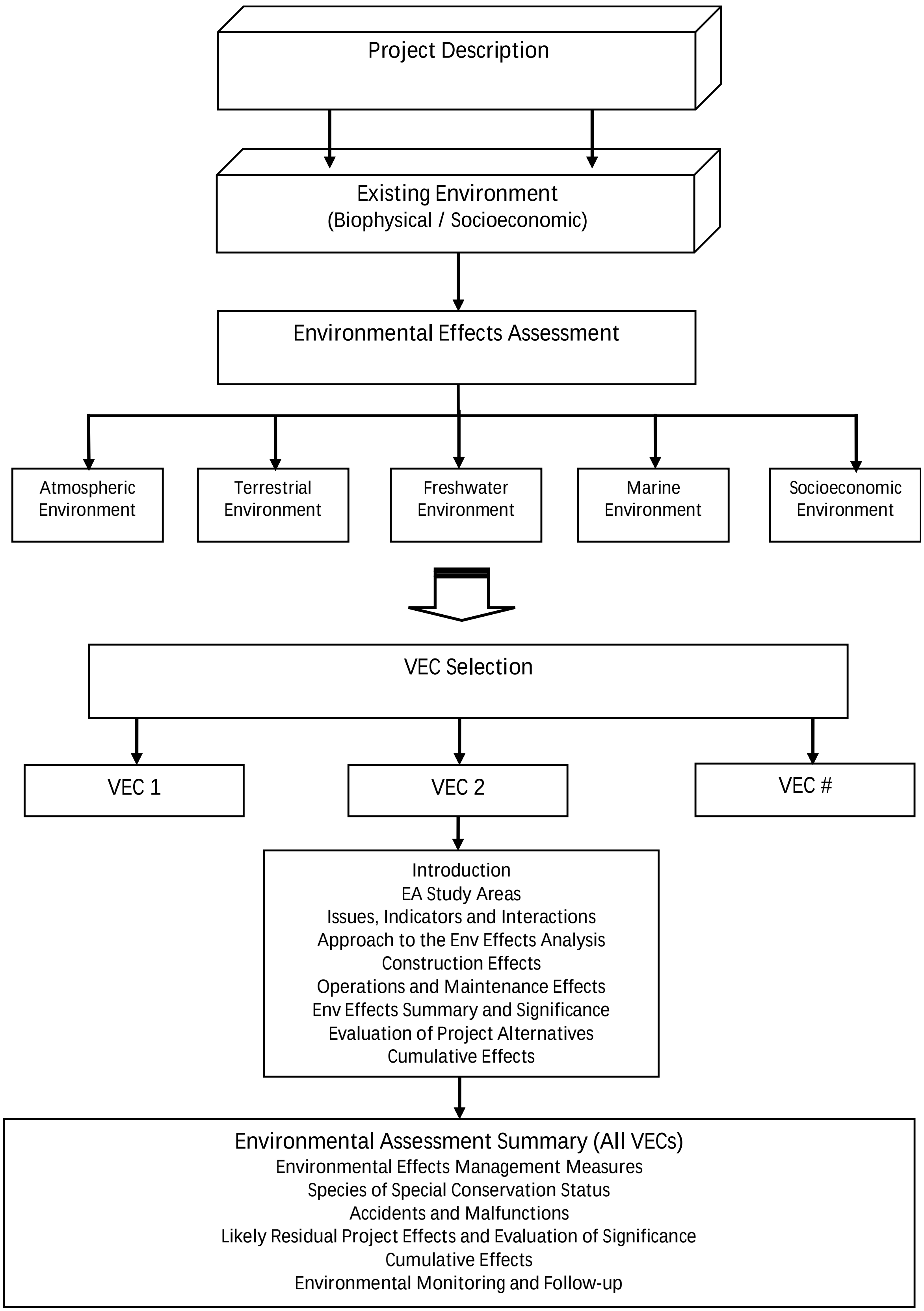

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FIGURE 9-1

Environmental Assessment Approach and Methods

Each Environmental Effects Assessment Chapter (Atmospheric, Terrestrial, Freshwater, Marine, Socioeconomic) begins with the identification and discussion of the VEC(s) that have been selected as the focus of the assessment, as well as the rationale for their selection.

For the biological (terrestrial, freshwater, marine) environment chapters, this section also discusses and demonstrates how any Species of Special Conservation Concern have been incorporated and addressed within these VECs and their associated environmental effects assessments.

During the selection of VECs, Nalcor considered that the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. In other words, culture and way of life of those using the area affected by the Project may also be considered as VECs, and that functional relationships within the environment may also be considered as VECs.

9.3 Valued Environmental Component–Specific Environmental Effects Assessments

Within each chapter, and following the above described general introduction and VEC selection sections, the environmental effects assessment is organized and presented on a VEC-by-VEC basis, with each stage of the analysis completed for each VEC in its own separate sub-section.

This is followed eventually by an overall summary of the EA results for that “environment” as a whole (atmospheric, terrestrial, freshwater, marine, socioeconomic), as described later.

9.3.1 Introduction

This section provides a brief overview of the VEC, further defining what it comprises and why it is being considered in the EA.

It also includes a high-level summary of the nature, presence, and distribution of this VEC with respect to the Project, as well as its current condition and status (and thus, it’s likely resilience or sensitivity to Project-induced change), which is then considered integrally throughout the effects assessment.

9.3.2 Environmental Assessment Study Areas

EA study areas (spatial and temporal boundaries) have been established for each VEC to direct and focus the environmental effects assessment. These study boundaries are generally VEC-specific, given the differences between the VECs in terms of their overall characteristics and the manner in which they may interact with the Project.

Spatial Boundaries: Two types of spatial boundaries have been defined and are described for each VEC:

- **Local Study Area (LSA)**: The locations within which Project components and activities that may affect the VEC will likely occur (e.g., right-of-way (ROW) clearing activity, transmission tower sites, quarries and access roads). The LSA is defined so as to generally encompass all aspects of the Project that may affect the VEC in question.
- **Regional Study Area (RSA)**: The area over which the Project’s potential effects on the VEC may extend, namely, its likely zone of influence. The RSA is based on factors such as the potential geographic extent and mobility of Project-related disturbances (such as air emissions, noise, sediment) and / or the distribution and movements of the VEC itself (the range and migration of affected wildlife, the communities or regions that may see Project benefits or effects).

Temporal Boundaries: In all cases, the temporal boundaries comprise the Construction, and Operations and Maintenance phases of the Project. All VEC assessment sections are based on these generic temporal boundaries, which, given that the Project is assumed to operate in perpetuity, fully encompasses the likely timing of all Project activities and the likely duration of any potential environmental effects.

9.3.3 Potential Environmental Issues, Indicators and Interactions

9.3.3.1 Potential Environmental Issues

In order to identify and focus on key environmental issues, and to ensure that these are fully considered and addressed in the EA, this section summarizes the various questions and issues associated with the Project and its potential effects on the VEC.

This includes those that have been included in the EIS Guidelines and Scoping Document, as well as those identified through Nalcor's Aboriginal, regulatory, stakeholder and public consultation (as outlined in Chapters 7 and 8), by the EIS study team itself, and / or through other Project-related environmental issues scoping activities.

The following table (Table 9.3.3-1) is used to list and organize these issues for each VEC (grouped by theme as appropriate):

Table 9.3.3-1 Identified Issues and Questions

Issue / Question	Nature and Rationale	Specific Considerations
What is the issue?	How and why is this an issue?	Any specific areas, times, species, or other factors identified as being of particular concern

9.3.3.2 Key Indicators and Measurable Parameters

In order to help ensure an appropriate focus and level of analytical rigour for the EA, the environmental effects assessment for each VEC identifies and focuses on relevant *Key Indicators* and associated Measurable Parameters. These are defined generally as follows:

- **Key Indicator (KI)**: An important component or aspect of the VEC which may be affected (changed) as a result of the Project. These may comprise subsets of the VEC itself (e.g., Avifauna VEC – Waterfowl KI, Raptors KI, Passerines KI), certain aspects of the VEC which may be affected by the Project and / or which have a particular importance (e.g., Furbearers VEC – Marten KI; Communities VEC – Services and Infrastructure KI), and / or that can serve as indicators of potential effects on the VEC overall.
- **Measurable Parameter (MP)**: A parameter associated with the KI, to which Project-related changes can be detected and measured (e.g., amount of primary habitat altered and available; regional unemployment and participation rates).

KIs and their associated MPs are identified and listed in the table provided below, and generally form the basis for the focus and structure of the subsequent VEC-specific environmental effects assessment.

Table 9.3.3-2 Key Indicators and Associated Measurable Parameters

Key Indicator	Rationale for Key Indicator	Measurable Parameters	Rationale for Measurable Parameters
KI 1		MP 1 MP #	
KI 2		MP 1 MP #	
KI #		MP 1 MP #	

9.3.3.3 Potential Project-VEC Interactions

This section generally identifies the potential ways that the Project may affect the VEC and each of its identified KIs, to again frame and focus the environmental effects assessment on important and likely issues and interactions.

This is presented in the following table, which lists the various key Project components and activities as well as the VEC-specific KIs. In each cell of the table, a brief note indicates (qualitatively) whether and how that Project component or activity could interact with the VEC and KI in question.

Table 9.3.3-3 Potential Project Interactions

Project Phase / Activity	Key Indicator	
	KI 1	KI #
Construction		
Construction access trails and roads		
Movement and presence of personnel, equipment and materials		
Construction camps		
Marshalling yards and staging areas		
Right-of-way clearing and preparation		
Quarrying and borrowing		
Transmission tower assembly and installation		
Conductor installation		
Converter station site preparation and construction		
Preparation and construction of submarine cable landing sites (on-land works)		
Construction and installation of submarine cables (marine works)		
Electrode site preparation and installation		
Island system upgrades		
Employment / presence of workers		
Contracting / expenditures		
System commissioning		
Operations and Maintenance		
Access trails and roads		
Presence and operation of the transmission system		
Routine line inspections and repairs		
Vegetation management		
Potential major system repairs		
Operation of the electrodes		
Employment / presence of workers		
Contracting / expenditures		

9.3.4 Approach to the Environmental Effects Assessment

As indicated previously, the approach and methods used in this EIS are in keeping with current EA best practice, with a view to ensuring a thorough, structured and rigorous analysis of the likely and important environmental effects of the Project.

This section first provides an overview of the analytical methods used to conduct the environmental effects assessment for the VEC. It includes a general description of the information and methods that have been used to characterize the existing (baseline) environment, as well as the manner in which this information and the Project description were used to predict the likely environmental effects of the Project on the VEC (by KI and MP), using a combination of quantitative and qualitative methods.

As specified in the EIS Guidelines and Scoping Document, and in keeping with standard EA practice, a variety of environmental effects criteria or "descriptors" have been developed and used to describe the nature and degree of the Project's predicted environmental effects. The following general descriptors have been used throughout, although the specific definitions and ratings for each have been developed on a VEC-specific basis:

- **Direction of the Effect**: Adverse, positive or neutral.
- **Magnitude**: The degree of change in the VEC / KI / MP from existing (baseline) conditions.
- **Geographic Extent**: The spatial area within which the effect will occur (Local, Regional or Beyond Regional), based on the specific LSA and RSA developed for the VEC.
- **Duration**: The period of time over which the environmental effect will likely be evident. (Note that effect "reversibility" is not addressed separately, as it is addressed through consideration of the duration of effect and the EA's temporal boundaries.)
- **Frequency**: How often an effect will occur (continuous, or at specific time intervals).

Each VEC section includes a table that describes and defines the various environmental effect descriptors that have been used. The level of confidence in the effects prediction is also indicated throughout.

As noted earlier, "VEC context" — namely, its current condition as a result of natural and / or anthropogenic factors, and its resulting resiliency or sensitivity to further change — has been established in describing the existing (baseline) environment. It has also been considered integrally when assessing the potential environmental effects of the Project (Sections 9.3.5 to 9.3.7) and cumulative environmental effects (Section 9.3.9).

Overall ecological and / or cultural and social context is considered and described as part of the rationale for VEC selection, as well as in the integral consideration of ecological and socioeconomic interactions and linkages between VECs, KIs and others aspects of the natural and human environments as part of the description of the existing environment and the effects assessment.

9.3.5 Construction

This section provides the detailed assessment of the potential environmental effects of the Construction phase of the Project on the VEC.

9.3.5.1 Overview of Project Construction and Associated Effects Management

Recognizing that Project components and activities will have differing degrees of relevance to specific VECs, this section begins with a brief summary of those particular aspects of Project Construction that may interact with the VEC in question, as well as highlighting the relevant environmental effects management measures outlined earlier.

9.3.5.2 Existing Knowledge

This section provides an overview of what is known and understood about the potential effects of the construction of transmission lines and other similar projects on the VEC. This includes relevant information and findings from the literature, reported environmental monitoring of other similar projects, and / or Nalcor's previous development projects and experience. In short, this section presents what is known about whether and how transmission developments affect a particular VEC and its identified KIs.

Such existing knowledge has been incorporated and used to inform the environmental effects assessment for the VEC. To enhance readability and brevity, this information is provided in summary form in Table 9.3.5-1 (organized by KI as appropriate).

Table 9.3.5-1 Existing Knowledge: Effects of Similar Projects on the VEC

Reference	Study / Project Context	Summary of Findings
KI 1		

9.3.5.3 Environmental Effects Assessment

The environmental effects assessment itself considers and describes the nature and degree of potential Project-induced change from the existing (baseline) environment (as described in Chapters 10 and 15).

The Construction environmental effects assessment is structured to address each KI individually and consecutively, assessing and describing the Project's potential effects on the KI with consideration of the relevant environmental effects descriptors outlined above.

Given the nature and overall geographic scale of the Project and its existing environment, the effects assessment is also organized on a regional basis where appropriate, using the following regions or an appropriate aggregation of them: Central and Southeastern Labrador; Strait of Belle Isle; Northern Peninsula; Central and Eastern Newfoundland; and, the Avalon Peninsula (Figure 9.3.5-1).

Environmental effects management (mitigation and optimization) measures are considered integrally and iteratively in the effects assessment. This includes those that have been "built-in" to the Project through its planning and design, so as to proactively avoid or reduce potential environmental issues (e.g., Chapters 2 and 3 - such as transmission corridor selection, construction approaches), as well as the standard environmental protection and benefits optimization measures that have been described earlier (Chapters 3 - 5). As per the CEAA, mitigation in this EA is defined as the elimination, reduction or control of the adverse environmental effects of the Project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. The rationale for and effectiveness of the proposed mitigation and enhancement measures are discussed, as appropriate, and evaluated. Available data, survey and study results and detailed mitigation measures that demonstrate a particular emphasis on avoidance of environmental effects are included in the EIS. From there, and with this base of general mitigation and optimization in place, the environmental effects assessment identifies and proposes further VEC-specific effects management measures as required and appropriate.

As a result, and in keeping with standard EA approaches and to optimize efficiency, the environmental effects assessment is therefore focused upon assessing and describing the likely residual environmental effects of the Project – namely, those adverse environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies, best management practices or other acceptable means.

FIGURE 9.3.5-1

Regions used to Present the Potential Effects of the Project

Nalcor does not discuss mitigation failure in this EIS, as the mitigation strategies (e.g., avoidance) and methods proposed for the Project are proven, industry standard, best management practices, and backed by Nalcor's extensive experience with similar projects throughout Newfoundland and Labrador. Nalcor is responsible for the implementation of these measures and all contractors and subcontractors will be required to adhere to the mitigation outlined in this EIS and associated documents (e.g., the Environmental Protection Plan (EPP)). As per Section 4.10 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011) Nalcor will prepare an EPP for each main construction site, and have the EPPs approved by the regulatory authorities before starting construction.

9.3.6 Operations and Maintenance

The VECs environmental effects assessment for the Operations and Maintenance phase of the Project is presented in this section, using the same approach and structure as that outlined above for the Construction phase.

9.3.7 Environmental Effects Summary and Evaluation of Significance

Up to this point, the environmental effects assessment for the VEC will have focused on the individual KIs and their associated MPs, by Project phase. The purpose of this section is to then summarize these results, providing overall conclusions about the likely residual environmental effects of the Project on the VEC.

9.3.7.1 Summary of Environmental Effects

This section provides a general summary of the overall likely residual environmental effects of the Project on the various KIs (including any differences in these effects between the KIs), as well as for the VEC overall.

This information is summarized in Table 9.3.7-1, using the various environmental effects descriptors that were initially defined for the VEC (as described earlier).

9.3.7.2 Definition and Determination of Significance

Evaluating the significance of the predicted likely environmental effects of a proposed project is one of the most important steps in any EA, and both the provincial and federal EA legislation require consideration of the significance of a project's likely effects.

This typically involves: 1) defining what a *significant* environmental effect is, and 2) on the basis of that definition, evaluating whether a project's likely environmental effects are *significant* or *not significant*. Like all aspects of an EIS, this then forms the basis for review and discussion by government regulators, Aboriginal and stakeholder groups and the public, and eventually, the determined significance of a project's likely environmental effects is a primary consideration in EA decisions by governments as to whether and how the project may proceed.

Significance definitions are developed and used at this stage of the environmental effects assessment for a VEC, which generally incorporate the principles of sustainability and other relevant concepts and considerations as appropriate. Significant environmental effects are those adverse effects that will cause a change in the VEC that will alter its status or integrity beyond an acceptable level. An environmental effect that does not meet the above criteria is considered not significant. Significance definitions are developed on a VEC-specific basis, or on a KI-specific basis as applicable.

This section provides an overall discussion of whether and how any of the likely residual environmental effects of the Project meet the significance criteria and definition established for the VEC / KIs, as well as an overall determination of the significance of the resulting total effect on the VEC.

Table 9.3.7-1 Environmental Effects Assessment Summary

Project Phase/Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	Magnitude	Geographic Extent	Duration	Frequency
Construction					
KI 1					
KI 2					
KI #					
Summary of Likely Residual Construction Effects on VEC:					
Operations and Maintenance					
KI 1					
KI 2					
KI #					
Summary of Likely Residual Operations and Maintenance Effects on VEC:					

9.3.8 Evaluation of Project Alternatives

As an important and valuable planning tool, EA is intended to help inform and influence project design, and in doing so, to help address the potential environmental outcomes of proposed development projects. The EA process therefore allows for the identification, analysis and evaluation of potential alternative project concepts and approaches, to help directly incorporate environmental considerations into project planning at an early stage.

In conjunction and concurrent with the EA process, Nalcor will be continuing with its technical and environmental analysis of the identified transmission corridors, including alternative corridors, in order to identify and eventually select a specific routing for the transmission line. This analysis includes a compilation of information on the existing natural and human environments within the transmission corridors, in order to identify and evaluate key environmental and socioeconomic factors and issues for consideration in the eventual route selection process. Inputs to this analysis and planning process will include existing and available information on the biophysical and socioeconomic environments, any additional information collected and issues identified as part of the EA process, as well as the results of the associated public and stakeholder consultations and any associated terms and conditions of EA approval (e.g., requirements to avoid certain environmental components in eventual route selection). The current proposed transmission corridor is intended to form the basis for eventual detailed route selection, subject to further refinement as Project engineering and environmental work continues. Once identified, and prior to final Project design and construction, Nalcor plans to conduct public consultations to present these transmission line routing(s) to the interested public and stakeholders. This will serve as a final check on its overall environmental acceptability, and allow for any final amendments to address any important remaining environmental issues, as required and possible. Detailed engineering and design for all Project components and activities has recently commenced, and will continue throughout and beyond the EA process. It includes consideration of Project requirements, including technical and economic factors, as well as environmental considerations.

As such, and as required under the provincial and federal EA legislation and the associated EIS Guidelines and Scoping Document, the EIS therefore also considers possible alternative means of carrying out the Project that are technically and economically feasible, and the environmental effects of the chosen alternative means. An initial analysis and discussion of potential alternative means of carrying out this Project was provided earlier in Chapter 2, including the identification of those alternatives that have been determined to be technically and economically feasible, and thus, which would be brought forward into the environmental effects assessment.

For each VEC, the initial and detailed environmental effects assessment (as outlined above) is focused specifically on the proposed (preferred) Project design concept (as described in detail in Chapter 3). From there, the various alternative means of carrying out the Project (alternative transmission corridor segments) that were identified in Chapter 2 as being potentially technically and economically feasible are then assessed in this sub-section, using a “comparative approach”.

Here, the potential environmental effects of each of these alternative corridor segments are assessed through a comparison to the predicted environmental effects of the proposed transmission corridor that is the subject of the preceding detailed environmental effects assessment. In doing so, this analysis considers and describes whether and how the potential environmental effects of each alternative segment would be different in nature and degree from those of the segment of the proposed transmission corridor that it would replace.

For each VEC, the results of this alternatives evaluation is provided in this section and summarized in Table 9.3.8-1.

Table 9.3.8-1 Summary Evaluation of Project Alternative Means

Project Alternative Means	Environmental Implications (Compared to the Proposed Project Concept)		
	KI 1	KI 2	KI #
A1			
A2			
A#			

The overall results of the VEC-specific analyses of alternative means are subsequently summarized at the end of each environmental effects assessment chapter, and then for the overall EIS in Chapter 17 (Summary and Conclusions).

9.3.9 Cumulative Environmental Effects

As specified under *CEAA* and in the EIS Guidelines and Scoping Document, the EIS also assesses and evaluates any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been carried out or are reasonably foreseeable.

The cumulative environmental effects assessment for each VEC is reported in this section, and considers the overall (total) effect on the VEC as a result of the Project's likely residual environmental effects (as summarized above) and those of other relevant projects and activities, using the following staged approach:

1) Past and ongoing projects and activities and their environmental effects are, as described earlier, reflected in the existing (baseline) environment (Chapters 10 and 15). Also, an overview of these previous and ongoing developments and other human activities in the general area of the Project was provided as part of the environmental setting and context (Chapter 6).

   The current condition of the VEC as a result of these natural and / or anthropogenic factors, and thus its overall sensitivity or resiliency to further disturbance or change, has been integrally considered throughout the environmental effects assessment. This current condition of the VEC is again briefly summarized here.

2) With this environmental baseline / current VEC condition established, the cumulative effects assessment then summarizes and considers whether and how this existing condition will be changed by the introduction of the Project and its residual environmental effects.

3) From here, other likely future projects and activities that are relevant to this VEC and its cumulative effects assessment are identified. These comprise any reasonably foreseeable future projects or activities whose effects on the VEC would likely overlap in space and time with those of the Project (e.g., overlap with the Project area and / or its zone of influence, affect the same wildlife populations or communities).

4) In cases where the predicted residual environmental effects of the Project on the VEC will overlap in space and time with those of one or more other future projects and activities, the potential cumulative effects of the Project in combination with those of the other relevant future developments are assessed and evaluated.

In summary, the cumulative effects assessment assesses and evaluates the overall (total) environmental effect on the VEC resulting from the likely residual effects of the Project in combination with those of other relevant past, present and reasonably foreseeable future projects and activities. In doing so the cumulative effects assessment:

- considers the effects of past and ongoing projects and activities as part of the pre-Project environment baseline, and integrally considers and incorporates this baseline — and the resulting current "condition" of the VEC — into the environmental effects assessment;
- it then assesses the likely nature and degree of change from this existing (baseline) environment as a result of the Project's effects in combination with other relevant future projects and activities; and
- finally, the VEC-specific cumulative effects assessment concludes by providing an evaluation of the significance of these predicted cumulative effects, using the same significance definition and approach as was used for the Project-specific effects assessment.

Table 9.3.9-1 is used in each VEC section to summarize the key results of the cumulative environmental effects assessment.

As in the earlier Project-specific environmental effects assessment, given the geographic scale involved it has also been necessary to structure and subdivide the cumulative effects assessment by region (i.e., Central and Southeastern Labrador, Strait of Belle Isle, Northern Peninsula, Central and Eastern Newfoundland, Avalon Peninsula) (Figure 9.3.5-1).

Table 9.3.9-1 Cumulative Environmental Effects Summary

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) VEC Condition (Reflecting the Effects of Past and Ongoing Projects and Activities)					
Likely Residual Environmental Effects of Labrador-Island Transmission Link (Reflecting Current VEC Condition, As Above)					
Likely Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities					
Cumulative Environmental Effects Summary					

The list in Table 9.3.9-2 provides a general indication of the "other future projects and activities" that have been considered in the cumulative effects assessment outlined above. The relevance of each is, of course, somewhat VEC-specific, and others that are relevant to a particular VEC are also identified and considered as required.

Table 9.3.9-2 Other Projects and Activities Considered in the Cumulative Effects Assessment

Potential Future Project / Activity	Overview and Status	Notes and Considerations
Labrador		
Lower Churchill Hydroelectric Generation Project	– Proposed hydroelectric facilities at Muskrat Falls and Gull Island and interconnecting transmission lines between them and Churchill Falls	– Future Construction, and Operations and Maintenance activities
Trans Labrador Highway, Phase 3 (Happy Valley-Goose Bay to Cartwright Junction)	– Construction completed, Highway opened / operational since late 2009	– Any new / future effects will likely be due to highway operations (presence of the road, increased access, etc.)
Proposed 5 Wing Goose Bay Supersonic Flight Training	– Altitude of 28,000 feet to 5,000 feet, north-west of Happy Valley-Goose Bay and north of Churchill Falls to the Labrador-Quebec border. Approximately 1,250 sorties / year between April to October, fighter jet aircraft such as the CF-18	– Considers future and proposed activity, effects of past low-level flying activity are reflected in the baseline environment
Commercial Forestry Activity	– District 19A (Goose Bay) 5-year Operating Plan (2008-2012) – District 21 (Labrador Straits area) 5-year Operating Plan (2007-2011)	– Including any amendments to the Plans
General Economic and Infrastructure Development	– General municipal and other civil works and development activities throughout the Central Labrador (Upper Lake Melville) and Labrador Straits regions	
Proposed Labrador West Mining and Related Developments	– Elross Lake Area / Direct-Shipping Iron Ore (New Millennium Capital Corp.) – Schefferville Iron Ore Mine - James and Redmond Properties (Labrador Iron Mines Ltd.) – Expansion of existing Labrador West mining development and associated growth	– Especially relevant for socioeconomic VEC(s)
Strait of Belle Isle (Marine Environment)		
Potential future changes to the intensity / nature / distribution of fishing activity in the Strait	– New and / or expanded fisheries activity in the Strait (e.g., since the re-opening of the previously closed scallop refugium in the area in 2009)	

Table 9.3.9-2 Other Projects and Activities Considered in the Cumulative Effects Assessment (continued)

Potential Future Project / Activity	Overview and Status	Notes and Considerations
Maritime Link	– A new transmission line between Cape Ray and Bottom Brook along an existing transmission corridor, Bottom Brook to Granite Canal in a combination of existing and new corridors, and Granite Canal to Bay d'espoir along an existing transmission line – Two subsea cables spanning approximately 180 km from Port Aconi (or Lingan), Nova Scotia to Cape Ray, Newfoundland (crossing the Cabot Strait)	– Outside the Strait of Belle Isle, but considered in relation to the marine environment
Newfoundland		
General Economic and Infrastructure Development	– General and likely works and development activities throughout the regions (e.g., transportation improvements, municipal works, proposed quarries, cottage development areas, small agricultural developments) – See, for example, the following for an indication of Projects currently undergoing provincial EA: – http://www.env.gov.nl.ca/env/env_assessment/projects/index.html	
Commercial Forestry Activity	– The proposed transmission corridor overlaps with portions of several Forest Management Districts: three on the Northern Peninsula, seven in the Central and Eastern portions of the Island and one on the Avalon Peninsula	– Planned activity but also including consideration of closure of several mills in Newfoundland in recent years
Long Harbour Processing Plant	– Initial construction of the processing plant began in April 2009 with construction to conclude in February 2013	– Especially relevant for socioeconomic VEC(s)
Oil and Gas Activities	– Hebron Development, Hibernia Southern Extension, White Rose Expansion, other likely exploration and development activities	– Especially relevant for socioeconomic VEC(s)
Maritime Link	– A new transmission line between Cape Ray and Bottom Brook along an existing transmission corridor, Bottom Brook to Granite Canal in a combination of existing and new corridors, and Granite Canal to Bay d'espoir along an existing transmission line – Two subsea cables spanning approximately 180 km from Port Aconi (or Lingan), Nova Scotia to Cape Ray, Newfoundland (crossing the Cabot Strait)	– Especially relevant for the caribou and socioeconomic VECs

9.4 Environmental Assessment Summary

As described above, the environmental effects assessment is completed on a VEC-by-VEC basis, with each stage of the analysis completed for each VEC in its own section. The various VECs have been grouped into larger chapters by "environment", namely for the: 1) Atmospheric Environment, 2) Terrestrial Environment, 3) Freshwater Environment, 4) Marine Environment, and 5) Socioeconomic Environment. At the end of each environment chapter, the VEC-by-VEC analysis is followed by an overall summary of the results and findings for that "environment" as a whole, which is organized according to the following subsections.

9.4.1 Effects Management Measures

For each VEC, environmental effects management measures that avoid or reduce potential adverse environmental effects and / or optimize Project benefits are presented. Mitigation is an integral element of the Project design and implementation. The effects assessment is based on the Project with identified mitigation in place.

9.4.2 Species of Special Conservation Concern

For the "biological environments" (terrestrial, freshwater and marine), this section provides a summary discussion of the various relevant Species of Special Conservation Concern, including: 1) a summary of those that have the potential to interact with the Project, 2) an indication of where and how these species have been addressed in the effects assessment, and finally, 3) to provide a species by species summary of the Project's potential effects on these species and their significance (Table 9.4.2-1).

Table 9.4.2-1 Species of Special Conservation Concern: Environmental Effects Summary

Species of Concern	How Addressed	Summary of Effects	Determination of Significance
Species 1			
Species #			

9.4.3 Accidents and Malfunctions

As described in Chapters 3 and 5 of this EIS, potential accidents and malfunctions have been assessed herein in several ways. Potential incidents that are of a relatively smaller scale and which, while unfortunate, are considered somewhat likely to occur during the course of the normal Construction, and Operations and Maintenance of a large development project have been addressed integrally as part of the VEC-specific environmental effects assessment for Project Construction, and Operations and Maintenance. This includes the identification of prevention and response measures.

Other potential accidents and malfunctions which are considered unlikely to occur, but which may be of a larger scale and have the potential to have different types and / or levels of environmental issues, are assessed separately in this section.

9.4.4 Residual Project Effects and Significance

This section provides an overall summary of the likely residual environmental effects of the Project on the atmospheric, terrestrial, freshwater, marine or socioeconomic environment, as applicable, including the likely significance of those effects and the basis for those conclusions.

9.4.5 Cumulative Environmental Effects

This section provides an overall summary of the likely cumulative environmental effects of the Project in combination with other projects and activities that have been carried out or are reasonably foreseeable. This includes a summary of: the other activities that were included in the cumulative effects assessment; the general nature of the cumulative effects on each of the VECs and the environment as a whole, and whether these cumulative effects are likely to be significant.

9.4.6 Environmental Monitoring and Follow-up

Each chapter concludes with a discussion of any proposed environmental monitoring and / or follow-up programs related to one or more of the associated VECs during Project Construction and / or Operations and Maintenance.

For the purposes of this EIS, environmental monitoring and follow-up are defined as follows:

- Monitoring programs are those implemented to meet standard regulatory requirements (such as may be required as a result of eventual Project permits), and / or to demonstrate compliance to environmental commitments made in the EIS.
- Follow-up programs are those that may be required and implemented to address any EA-related issues of uncertainty, such as to verify the environmental effects predictions and / or the effectiveness of implemented environmental effects management measures and to determine whether to implement adaptive management measures.

This section provides an overview discussion of any such environmental monitoring and / or follow-up programs that may be required or proposed for one or more of the associated VECs, as outlined in section 4.6.4 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011).

Monitoring requirements will be stipulated by the regulators in the eventual Project permits, including details such as scheduling, sampling design, frequency, and reporting, and Nalcor will comply with the requirements.

Monitoring programs will include, as appropriate:

- the objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives;
- the sampling design, methodology, selection of the subjects and indicators to be monitored, and their selection criteria;
- the frequency, duration and geographic extent of monitoring, and justification for the extent;
- the application of the principles of Adaptive Environmental Management;
- reporting and response mechanisms, including criteria for initiating a response and procedures;
- the approaches and methods for monitoring the cumulative effects of the Project with existing and future developments in the Project area;
- integration of monitoring results with other aspects of the Project including adjustments to operating procedures and refinement of mitigation measures;
- experience gained from previous and existing monitoring programs;
- the advisory roles of independent experts, government agencies, communities, holders of Aboriginal traditional and community knowledge and renewable resource users;

- procedures to assess the effectiveness of monitoring and follow-up programs, mitigation measures and recovery programs for areas disturbed by the Project; and
- a communications plan to describe the results of monitoring to interested parties.

Nalcor has committed to working with the regulators and other stakeholders to finalize the details of many of the follow-up programs outlined in this EIS.

In association with the above approach, Nalcor will explain how the public and Aboriginal groups will continue to be involved, including participation in the design and implementation of environmental management and monitoring and follow-up programs, as appropriate. This process will include describing plans to maintain communications and working relationships with the affected communities, Aboriginal organizations, municipalities and government agencies throughout the life of the Project, as appropriate. Nalcor will discuss ways in which holders of Aboriginal traditional and community knowledge, including elders, women and youth, could be involved in any monitoring and follow-up programs, with the appropriate Aboriginal groups and communities, during the development of these programs.

Nalcor continues to improve their approaches based on experience gained in the construction and operation of their various projects and systems throughout Newfoundland and Labrador. If unforeseen adverse environmental effects are identified during any of the monitoring or follow-up programs, Nalcor will, as per their ongoing adaptive management process, adjust the existing mitigation measures or, if necessary, develop new mitigation or other measures to address those effects. This could result in Nalcor refining or modifying the design and implementation of management plans, mitigation measures and Project operations, with the final approach selected depending on the issue identified.

9.5 Guiding Principles of the Environmental Assessment

The reader is referred to Chapter 8, Appendix 8-1 of this EIS, for the conformance table that provides the reference to the EIS section that addresses each of the EIS Guidelines and Scoping Document.

9.5.1 Environmental Assessment: A Planning Tool

As noted in section 2.1 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), Nalcor considers this EA to be a planning tool that enables consideration of the potential effects of the Project in a careful and precautionary manner before actions are taken to allow the Project to proceed. As such, the EA is a process for identifying the Project's potential interactions with the environment, predicting environmental effects, identifying mitigation measures and evaluating the significance of residual environmental likely effects in order to promote sustainability, protect the environment, and facilitate the wise management of natural resources. The EA also provides the basis for setting out the requirements for monitoring and reporting to verify compliance with the terms and conditions of approval and the accuracy and effectiveness of predictions and mitigation measures.

9.5.2 Aboriginal and Public Participation

Nalcor considers Aboriginal and public participation to be a central objective of the EA process and a means to ensure consideration and response to Aboriginal and public concerns. During the preparation of the EIS, Nalcor informed and consulted, where possible, with all potentially affected Aboriginal and local communities, interested regional and national organizations and resource users. To facilitate this, Nalcor has prepared a plain language summary of the EIS, in accordance with Section 4.1.2 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011).

Nalcor understands that meaningful public involvement can take place when Aboriginal groups and the public have a clear understanding of the nature of the Project as early as possible in the EA process. As such, Nalcor:

- will continue to provide up-to-date information, as it becomes available, to Aboriginal groups and the public, and especially to the communities likely to be affected by the Project;
- will continue to involve the main interested parties in determining how best to deliver that information, that is, the type of information required, format and presentation methods, as well as the need for community meetings;
- will explain the results of the EIS in a clear and direct manner (i.e., plain language summary) to make the issues comprehensible to the widest possible audience; and
- has, and will continue to consider and acknowledge all requests for consultation with Aboriginal groups during Project approvals and throughout the life of the Project.

9.5.3 Aboriginal Traditional and Community Knowledge

Nalcor appreciates that populations living in proximity to the Project may have substantial and distinct knowledge, which can be considered in the assessment of the effects of the Project, and their mitigation. As such, Nalcor considered Aboriginal traditional and community knowledge of the existing environment as an integral part of the EIS, to the extent that it was available.

As outlined in section 2.3 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), in EA, Aboriginal traditional and community knowledge may be regarded as the knowledge, understanding and values that residents of Aboriginal and local communities have in relation to the environment and the potential environmental effects of the Project and proposed mitigation measures. Nalcor understands that this knowledge is based on personal observation, collective experience and / or oral transmissions. This knowledge may also have been studied and inventoried by specialists in such areas as anthropology, sociology, ethnology, heritage, history, medicine, environment, ecology and biology, and all such studies and inventories may be relevant.

Aboriginal traditional knowledge (referred to as Aboriginal Ecological Knowledge in this EIS) and community knowledge (referred to as Local Ecological Knowledge in this EIS) gathered related to the biophysical existing environment are presented in Chapter 10. Knowledge on the socioeconomic existing environment (Chapter 15) is incorporated into the baseline information and not presented separately, but rather integrally considered through the chapter as appropriate.

Nalcor considered the Aboriginal traditional and community knowledge in assisting in its understanding, including the inter-relationships, among such matters as: ecosystem function; resource abundance, distribution and quality; social and economic well-being; and use of the land and resources. Nalcor also considered the traditional and community knowledge that was available, to inform the development of adequate baseline information, identification of key issues, prediction of effects, and assessment of their significance.

9.5.4 Sustainable Development

As discussed in Section 2.4 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), sustainable development seeks to meet the needs of present generations without compromising the ability of future generations to meet their own needs. The objectives of sustainable development are:

- the preservation of ecosystem integrity, including the capability of natural systems to maintain their structures and functions, and to support biological diversity;

- the respect for the right of future generations to the sustainable use of renewable and non-renewable resources; and
- the extent, distribution and duration of social and economic benefits.

Nalcor has promoted sustainable development as a fundamental purpose of EA, and has included the following in the EIS:

- the extent to which biological diversity is affected by the Project;
- the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of present and future generations; and
- the extent, distribution and duration of social and economic benefits.

Nalcor integrated these factors into the planning and decision-making process for the Project, including seeking the views of interested parties, by considering the sustainability of populations in the evaluation of likely residual effects, including cumulative effects, of the Project.

In addition, as per Section 4.5.4 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011) Nalcor has described the renewable resources that may be affected by the Project, including living (e.g., fish, wildlife, forests) and non-living (e.g., water) renewable resources. This EA clearly establishes, taking into account the effects assessment, whether these renewable resources are likely to be significantly affected following the implementation of proposed mitigation measures. This is addressed primarily through the assessment of the effects of the Project on the VECs selected for vegetation, avifauna (terrestrial / freshwater and marine), caribou, furbearers, fish and fish habitat (freshwater and marine), marine mammals, and water resources (freshwater and marine). In addition, the results of the assessment informed the discussions related to the potential Project effects on sustainability and biodiversity, which are directly related to renewable resources.

9.5.5 Precautionary Principle

Section 2.5 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011) states that "one of the purposes of environmental assessment is to ensure that projects are considered in a careful and precautionary manner before action is taken in connection with them in order to ensure that such projects do not cause significant adverse environmental effects."

Further, Section 2.5 outlines Principle 15 of the 1992 Rio Declaration of Environment and Development, which states that "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

In applying a precautionary approach for this Project, within this EIS Nalcor has:

- demonstrated that the proposed Project has been examined in a careful and precautionary manner;
- outlined the assumptions made about the effects of the Project and the approaches to prevent and minimize these effects;
- identified where knowledge uncertainty exists in the predictions of the environmental effects of the Project; and
- identified any follow-up and monitoring activities planned, particularly in areas where knowledge uncertainty exists in the prediction of the effects of the Project.

As outlined in the above subsections, this EIS has been conducted to ensure that the Project was considered in a careful and precautionary manner so that the resulting likely residual effects are not significant. Nalcor recognizes the diverse assemblage of habitat types, and environmental and social sensitivities in the regions crossed by the Project components (e.g., transmission corridor, electrode lines, shore electrodes, access, temporary camps, laydown areas, quarries) and has gathered information from several sources, including Aboriginal, regulator and stakeholder consultation, to assist in the ongoing planning of the Project and to inform the effects assessment (i.e., accurate data and maps were used).

As part of its careful and precautionary approach, and as requested in Section 4.6.1 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), Nalcor identified mitigation measures which includes best available technology, best management practices, and avoidance through the implementation of scheduling, siting constraints and pollution prevention opportunities. This process has resulted in the initial application of mitigation related to routing of the corridor (e.g., re-routing to avoid Gros Morne National Park); application of proven, minimal disturbance technology (e.g., horizontal directional drill of the shoreline landings for the submarine cable crossings of the Strait of Belle Isle); and use of existing disturbance corridors (e.g., routing the western portion of the transmission corridor along the Trans-Labrador Highway (Phase 3)). All technically and economically feasible mitigation measures that were appropriate were considered. Trade-offs between costs and predicted effectiveness of the mitigation were considered during the development of the mitigation strategies, with the emphasis placed on the effectiveness of the mitigation.

This EIS is also part of Nalcor's commitment to apply the precautionary principle to the Project development (i.e., taking action to protect the public and / or the environment if there is a likely effect, considering the best available science, even if scientific certainty is not available to fully assess the effect). Nalcor is proposing to use cost-effective, proven approaches (i.e., best management practices) and mitigation, regardless of the level of scientific certainty about Project effects, to prevent environmental degradation, and to construct and operate the Project in a manner that conforms to the aim of sustainable development. This consideration of sustainability includes providing the province with a source of reliable, clean, economical electrical power to allow it to meet Newfoundland and Labrador's 2007 Energy Plan.

Regardless of the level of certainty (i.e., confidence in the predictions made in the EA), Nalcor's effects management measures (mitigation) are consistent with taking a precautionary approach to Project development, which also includes application of the Precautionary Principle. Follow-up programs have been proposed, as appropriate, that have been designed to verify the accuracy of effects predictions, and the effectiveness of mitigation. Nalcor will use information provided by Aboriginal and / or stakeholder groups, or obtained from any of the monitoring and / or follow-up programs undertaken to feed into their adaptive management process for continued improvement. The adaptive management process will ensure timely, proactive responses to identified issues to limit the resulting effect.

9.6 References

Government of Newfoundland and Labrador and Government of Canada. 2011. Environmental Impact Statement Guidelines and Scoping Document, Labrador-Island Transmission Link. Prepared for Nalcor Energy. St. John's, NL.

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