VANCOUVER ISLAND
TRANSMISSION REINFORCEMENT PROJECT

APPROVED
TERMS OF REFERENCE
FOR AN
ENVIRONMENTAL ASSESSMENT
CERTIFICATE APPLICATION

ARNOTT SUBSTATION, DELTA, B.C.
TO
VANCOUVER ISLAND TERMINAL, NORTH COWICHAN, B.C.

Issued by:

British Columbia Environmental Assessment Office
2nd Floor - 836 Yates Street
Victoria, B.C. V8W IL8

Prepared by:

BC hydro
ENGINEERING

British Columbia Transmission Corporation™
Rev. 5
January 2006
These Terms of Reference have been prepared as a basis for defining the scope, assessment methodologies, and consultation processes to be followed for an Application for an Environmental Assessment Certificate pursuant to the British Columbia Environmental Assessment Act (BCEAA), and concurrently, for a Screening Level Environmental Assessment pursuant to the Canadian Environmental Assessment Act (CEAA) for the Vancouver Island Transmission Reinforcement Project (VITR, the Project). A portion of the VITR Project will take place in U.S. waters. A separate environmental assessment will be conducted to satisfy the requirements of the Washington State Environmental Policy Act (SEPA) and the federal National Environmental Policy Act (NEPA) for the portion of the Project which is within U.S. jurisdiction.

The VITR Project involves the proposed replacement and upgrade of BC Hydro’s existing 138 kV overhead line and submarine cable transmission interconnection system from the Arnott Substation (ARN) in Delta, B.C., to the Vancouver Island Terminal (VIT) in North Cowichan, B.C.

The Project is required to achieve the following objectives:

- To provide adequate system reliability and to meet current and future electricity demand on Vancouver Island.
- The existing HVDC system is nearing the end of its service life and its firm capacity will be derated to zero in the fall of 2007. Some of the critical AC/DC conversion equipment is obsolete and no longer supported by the manufacturer.
- Providing greater firm electrical transmission capacity than is available with the existing infrastructure. The existing 138 kV alternating current (AC) submarine cable transmission system is approximately 50 years old and is beyond its design service life. It is no longer used for bulk electricity transfer to Vancouver Island, and is only used for electricity service to the Southern Gulf Islands and for emergency purposes.
To reduce ongoing operating and maintenance costs. Due to ageing equipment, the existing facilities require increasing levels of expenditure for maintenance and repairs.

To reduce the potential for environmental effects resulting from cable failures and the activities needed to repair or replace failed sections of cable.

To decrease exposure to system failures due to seismic events (earthquakes). The existing HVDC conversion equipment is vulnerable to earthquake damage, especially at the ARN Substation.

The British Columbia Transmission Corporation (BCTC, the Proponent) applied to the BC Environmental Assessment Office (BCEAO) on November 10, 2004 under Section 7 of BCEAA to have the Project designated as a “reviewable project” under BCEAA. The BCEAO advised BCTC on December 1, 2004 that this application had been granted. On January 11, 2005, the BCEAO issued an order under Section 10 of BCEAA that sets out the general terms for the environmental review process for the Project. These Terms of Reference have been prepared by BCTC pursuant to the Section 11 Procedural Order under BCEAA to identify the issues to be addressed and the information to be provided in its Application for an Environmental Assessment Certificate.

The Application for an Environmental Assessment Certificate/Screening Level Environmental Assessment Report (the “EAC Application”) for the Project will be organized and structured consistent with these Terms of Reference to facilitate a harmonized review of the Project under BCEAA and CEAA. BCTC submitted these Terms of Reference in draft form to the BCEAO, the Canadian Environmental Assessment Agency (CEA Agency), First Nations, and the public for review, comment, and input to achieve agreement on the proposed scope and methodologies to be used in preparing the EAC Application.

These Terms of Reference have subsequently been approved by the BCEAO, in consultation with the CEA Agency and the Responsible Authorities under CEAA, and will be posted on the BCEAO’s Project Information Centre website.
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### LIST OF ABBREVIATIONS

**Context**
*A List of Abbreviations will be included in the EAC Application. It will be based on the following list, and expanded as necessary during the preparation of EAC Application for the Project.*

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</tr>
<tr>
<td>ARN</td>
<td>Arnott Substation</td>
</tr>
<tr>
<td>BC Hydro</td>
<td>British Columbia Power and Hydro Authority</td>
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<tr>
<td>BCEAA</td>
<td>British Columbia Environmental Assessment Act</td>
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<tr>
<td>BCEAO</td>
<td>British Columbia Environmental Assessment Office</td>
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<tr>
<td>BCTC</td>
<td>British Columbia Transmission Corporation</td>
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<tr>
<td>BCUC</td>
<td>British Columbia Utilities Commission</td>
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<tr>
<td>CDC</td>
<td>Conservation Data Centre</td>
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<tr>
<td>CEA Agency</td>
<td>Canadian Environmental Assessment Agency</td>
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<tr>
<td>CEAA</td>
<td>Canadian Environmental Assessment Act</td>
</tr>
<tr>
<td>COSEWIC</td>
<td>Committee on the Status of Endangered Wildlife in Canada</td>
</tr>
<tr>
<td>CPCN</td>
<td>Certificate of Public Convenience and Necessity</td>
</tr>
<tr>
<td>CWS</td>
<td>Canadian Wildlife Service</td>
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<tr>
<td>DFO</td>
<td>Fisheries and Oceans Canada</td>
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<tr>
<td>DPAs</td>
<td>Development Permit Areas</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>EAC</td>
<td>Environmental Assessment Certificate</td>
</tr>
<tr>
<td>EBT</td>
<td>English Bluff Terminal</td>
</tr>
<tr>
<td>EMF</td>
<td>Electromagnetic Field Effects</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
</tr>
<tr>
<td>ESA</td>
<td>Endangered Species Act</td>
</tr>
<tr>
<td>ESAs</td>
<td>Environmentally Sensitive Areas</td>
</tr>
<tr>
<td>FREMP</td>
<td>Fraser River Estuary Management Program</td>
</tr>
<tr>
<td>GLS</td>
<td>Galiano Substation</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>HADD</td>
<td>Harmful Alteration, Disruption, or Destruction</td>
</tr>
<tr>
<td>JARPA</td>
<td>Joint Aquatic Resources Permit Application</td>
</tr>
<tr>
<td>kV</td>
<td>Kilovolt</td>
</tr>
<tr>
<td>MBO</td>
<td>Maricaibo Terminal</td>
</tr>
<tr>
<td>MTG</td>
<td>Montague Harbour Terminal</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>PEM</td>
<td>Predictive Ecosystem Mapping</td>
</tr>
<tr>
<td>RA(s)</td>
<td>Responsible Authority(ies) under CEAA</td>
</tr>
<tr>
<td>SAL</td>
<td>Salt Spring Island Substation</td>
</tr>
<tr>
<td>SARA</td>
<td>Species at Risk Act</td>
</tr>
<tr>
<td>TBY</td>
<td>Taylor Bay Terminal</td>
</tr>
<tr>
<td>TEM</td>
<td>Terrestrial Ecosystem Mapping</td>
</tr>
<tr>
<td>VIT</td>
<td>Vancouver Island Terminal</td>
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</tbody>
</table>
**GLOSSARY**

**Context**

A glossary will be included in the EAC Application to define commonly used terms and phrases. It will be based on the following list, and expanded as necessary during the preparation of EAC Application for the Project.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Lifting</td>
<td>Use of an air compressor to inject air into the bottom end of a 150 - 500 mm diameter vertical tube. The rising air expands, creating a lower pressure area at the bottom opening. Sediments are drawn into the bottom of the tube and ejected from the top. The method is especially useful for light excavation of underwater trenches in gravel and cobble sea bottoms and for uncovering existing buried cables.</td>
</tr>
<tr>
<td>Alternating current (AC) transmission system</td>
<td>Alternating Current (AC) transmission systems are a type of electrical power system in which voltage and current reverse direction each half-cycle. AC electrical systems utilize voltages and currents that vary in time between positive and negative values to operate electrical equipment. AC systems in North America operate at 60 cycles per second.</td>
</tr>
<tr>
<td>Anchor</td>
<td>For overhead line construction, device that serves as a reliable support to hold an object firmly in place, usually guy wires.</td>
</tr>
<tr>
<td>Archaeological Impact Assessment (AIA)</td>
<td>The purpose of an AIA is to identify archaeological and historical sites, evaluate their significance, assess ongoing and potential effects by development activities on heritage sites, and recommend appropriate Impact Management measures as required. An AIA involves field investigations with local First Nations, and normally follows and is guided by the results of the preceding AOA or Preliminary Field Reconnaissance. In larger projects, an AIA and AOA may be combined. Requires a Heritage Inspection Permit.</td>
</tr>
<tr>
<td>Archaeological Overview Assessment (AOA)</td>
<td>An AOA is undertaken to identify lands within a study area that have potential to contain archaeological or historical sites, identify potential conflicts between sites and ongoing or proposed development activities, and provide recommendations for additional heritage investigations as required. An AOA involves documentary research, consultation with First Nations and stakeholders, and an optional Preliminary Field Reconnaissance.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Armour Wires</td>
<td>Steel, copper or bronze wires or straps around the outside of a submarine cable. Their primary purpose is to help the cable withstand the high tensions developed during cable-laying. The secondary purpose is to provide some protection to the cables from external abrasion, contact by fishing gear and anchors.</td>
</tr>
<tr>
<td>British Columbia Transmission Corporation (BCTC)</td>
<td>A provincial Crown Corporation, formed in May 2003, responsible for managing, operating, planning and maintaining most of the provincial electrical power transmission system and its interconnections with the larger North American grid.</td>
</tr>
<tr>
<td>British Columbia Utilities Commission (BCUC)</td>
<td>The British Columbia Utilities Commission is an independent regulatory agency of the Provincial Government that operates under and administers the <em>Utilities Commission Act</em>. The Commission's primary responsibility is the regulation of British Columbia's natural gas and electricity utilities under its jurisdiction to ensure that the rates charged for energy are fair, just and reasonable, and that utilities provide safe, adequate and secure service to their customers.</td>
</tr>
<tr>
<td>Cable Terminal</td>
<td>A non-generating electrical power station where a transition is made from overhead transmission to underground or submarine transmission. For the purposes of this Terms of Reference, the terms “cable terminals” refers to English Bluff Terminal (EBT), Taylor Bay Terminal (TBY), Montague Harbour Terminal (MTG), and Maricaibo Terminal (MBO).</td>
</tr>
<tr>
<td>Cathodic protection</td>
<td>The reduction or prevention of corrosion by impressing a low level direct current or installing passive sacrificial anodes.</td>
</tr>
<tr>
<td>Circuit breaker</td>
<td>A control device for connecting or disconnecting a transmission line under normal load or emergency fault conditions.</td>
</tr>
<tr>
<td>Committee on the Status of Endangered Wildlife in Canada (COSEWIC)</td>
<td>Committee of experts reporting to the federal Minister of Environment that assesses and designates which wild species are in some danger of disappearing from Canada.</td>
</tr>
<tr>
<td>Conductor</td>
<td>Wire or group of wires not insulated from each other, suitable for carrying an electrical current.</td>
</tr>
<tr>
<td>Construction</td>
<td>Refers to both removal of the existing 138 kV transmission lines and submarine cables, and installation of the new transmission lines and submarine cables, including modifications to the ARN and VIT substations and cable terminals.</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>Refers to the eventual removal and dismantling of the proposed new transmission line and submarine cable infrastructure at the end of its useful life (in approximately 60 or more years).</td>
</tr>
<tr>
<td>Dendritic</td>
<td>A branch-like formation of incised drainage channels throughout the intertidal and shallow subtidal areas.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Electromagnetic Fields (EMF)</td>
<td>Term used to describe the electric and magnetic fields that exist wherever energized electrical equipment or appliances are located. The electric fields are associated with voltage; and the magnetic fields are associated with the amount of current being used.</td>
</tr>
<tr>
<td>Environmental Management Plan (EMP)</td>
<td>Document that identifies and investigates environmental aspects and effects related to the project; prescribes suitable mitigation measures to effectively minimize environmental effects during construction and to address conditions in planning and environmental approvals, relevant regulations, guidelines, and policies; and defines responsibilities for environmental management</td>
</tr>
<tr>
<td>Field Reconnaissance-Level Surveys</td>
<td>Field surveys and investigations for the inventory and assessment of fisheries, wildlife, and vegetation resources along the transmission corridor. The term “reconnaissance” means the field studies and investigations would include the entire transmission corridor, augmented by limited data collection and sampling at specific locations. All field surveys would be undertaken during the spring, summer, and/or fall. It is not intended that the field surveys and investigations in support of the assessment for this Project would involve multiple years of data collection, sampling, and enumeration. Details describing the proposed study area boundaries, assessment methodologies, survey and sampling protocols will be described in relevant work plans for review by Fisheries and Oceans Canada (DFO), Environment Canada, Canadian Wildlife Service, and the Ministry of Environment (MOE).</td>
</tr>
<tr>
<td>High Voltage Direct Current (HVDC) system</td>
<td>A term that describes the type of power system in which electric current flows in a single direction and whose voltage magnitude does not vary, or varies only slowly</td>
</tr>
<tr>
<td>Insulator</td>
<td>A device, made of non-conducting material, used to give support to electrical conductors and shield them from ground or other conductors. An insulator inhibits the flow of current from the conductor to the earth or another conductor.</td>
</tr>
<tr>
<td>KiloVolt (kV)</td>
<td>One thousand volts</td>
</tr>
<tr>
<td>Linear alkylbenzene (LAB)</td>
<td>Insulating fluid typically used in self contained fluid-filled (SCFF) power cables to control the high electric stresses in the insulation.</td>
</tr>
<tr>
<td>Mitigation</td>
<td>Measures taken to reduce, and where possible, preclude potentially adverse effects.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Phase shifting transformer</td>
<td>A large device that controls the voltage phase-angle relationship of one circuit in respect to another. In the case of the Vancouver Island Transmission Reinforcement Project, the transformer will help to balance power flow between the northern and southern transmission corridors connecting to Vancouver Island.</td>
</tr>
<tr>
<td>Pole structure</td>
<td>A column or columns of tapered wood, steel, or concrete, supporting overhead conductors on arms or brackets. In transmission, generally used at voltage levels of 230 kV or lower.</td>
</tr>
<tr>
<td>Project Area</td>
<td>Encompasses, but is not limited to, the transmission corridor and land occupied by the cable terminals and substations from the Ladner area of Delta, across the Georgia Strait, over Galiano Island, across Trincomali Channel, over Salt Spring Island, and over to Vancouver Island. The Project area starts at the ARN substation in Delta, and ends at VIT in North Cowichan on Vancouver Island. The spatial boundaries of the Project area will be defined in the EAC Application.</td>
</tr>
<tr>
<td>RAAD (Remote Access to Archaeological Data):</td>
<td>Provincial GIS database that provides information about registered archaeological site locations and boundaries, and detailed information about each site. This information is provided to BC Hydro under a confidentiality agreement, and the data cannot be released to the public. The data is entered into BC Hydro's EGIS system to identify possible effects on registered archaeological sites from BC Hydro activities.</td>
</tr>
<tr>
<td>Residual effects</td>
<td>Environmental effects that may still be present after implementation of the recommended mitigation measures.</td>
</tr>
<tr>
<td>Right-of-way</td>
<td>A right-of-way is a right to pass over the lands of another and is generally understood as the land reserved for placement of a physical improvement such as a railway, transmission line or pipeline. Specifically for the Project, this term is used collectively for all individual rights-of-way.</td>
</tr>
<tr>
<td>Structure</td>
<td>Provides support for the overhead conductor. Structure types include wood pole or several wood poles together (i.e. H frame), steel or concrete poles, or lattice steel tower.</td>
</tr>
<tr>
<td>Submarine Cables</td>
<td>Refers to transmission lines which are specifically designed to convey electrical current beneath the ocean. A submarine cable typically has a diameter of approximately 100 to 150 mm.</td>
</tr>
<tr>
<td>Substation</td>
<td>A non-generating electrical power station that serves to transform voltages to higher or lower levels. For the purposes of this Terms of Reference, the term “substations” refers to the Arnott Substation (ARN) in Delta, and the Vancouver Island Terminal Substation (VIT) in North Cowichan on Vancouver Island.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td><strong>Transmission Corridor</strong></td>
<td>Encompasses the designated transmission line right-of-way and and adjacent tree or vegetation clearance zones within the Project area between ARN and VIT. The width of the transmission corridor will be the right-of-way in urban areas, and up to a 100 m buffer from each edge of the right-of-way in rural areas, as described in the Vegetation Work Plan to be prepared in conjunction with MOE.</td>
</tr>
<tr>
<td><strong>Transmission Line</strong></td>
<td>Refers to both existing overhead, as well as the proposed overhead and/or underground transmission lines and structures within the Project area.</td>
</tr>
<tr>
<td><strong>Water-jetting</strong></td>
<td>Use of focused high pressure water-jets to fluidize a narrow trench in the sea bottom for cable burial. It can be done by divers in shallow water, but is most effectively done using specialized, neutral buoyancy water-jetting machines.</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION

This Chapter of the EAC Application will provide general background information on BCTC, the Purpose and Organization of the EAC Application, the Project, and the regulatory regimes that apply to the Project. As indicated, a portion of the VITR Project will take place in U.S. waters. U.S. requirements are being dealt with separately through the Washington State Environmental Policy Act (SEPA) and federal National Environmental Policy Act (NEPA) environmental assessment processes. Accordingly, a separate environmental assessment will be conducted to satisfy the requirements for the portion of the Project that is within U.S. jurisdiction.

1.1 Proponent Identification

- Proponent history, description, roles and responsibility (including responsibility for providing safe and reliable transmission service to Vancouver Island) and contact information (i.e. name, address, phone, fax, and email).
- Relationship of the Proponent to BC Hydro.

1.2 Purpose and Organization

- Summarize structural components of the EAC Application.
- Summarize any other legal orders or agreements applying to the review of the Project, such as the Section 11 Procedural Order to be issued under BCEAA.

1.3 Terms of Reference

- Describe information sources used to prepare the Terms of Reference and to “scope” the environmental assessment studies.
- Describe roles and responsibilities of the professional environmental consultants retained by BCTC to prepare the Terms of Reference, conduct the technical studies, and to prepare the EAC Application in accordance with the Terms of Reference.
- Summarize input received from regulatory agencies, public, and First Nations during preparation of the Terms of Reference.
1.4 **Project Overview**

- Prepare a brief description of the Project and its purpose, referencing the detailed Project Description to be provided in Chapter 4.0 of the EAC Application.
- Describe the Project’s location, size and main features.
- Provide a clear identification and listing of Project elements included in the “Project Scope” including reference to orders defining the scope of the Project for the purposes of the environmental assessment under BCEAA and CEAA.
- Confirm whether the Project requires use of Crown land and/or private land including submerged/marine lands.
- Include figure or maps showing regional context and site-specific setting.
- Provide an estimate of the total labour force required (direct labour) during construction and operation.
- Provide an estimate of the capital costs of the Project.

1.5 **Project Rationale**

- Summarize Project rationale.
- Summarize Project planning and history to date.
- List Project benefits, including continued reliable service of electricity to Vancouver Island, environmental, social, and economic.

1.6 **Regulatory Framework**

- Identify and summarize relevant Canadian legislative and policy requirements governing the Project, and applicable local government bylaws, official community plan, and zoning requirements.
1.6.1 Canadian Jurisdiction

- Prepare a table summarizing enabling legislation, names of regulatory agencies, and relevant permits, approvals, authorizations for each of the Canadian federal, provincial, and local levels of government.
- Identify if concurrent certification/permitting is being sought under provincial legislation through Section 23 of BCEAA.

1.6.2 Concordance Table

- Prepare a summary table which cross-references the information presented in the EAC Application with the requirements of specific sections of BCEAA and CEAA.
2.0 INFORMATION DISTRIBUTION AND CONSULTATION

This Chapter will summarize BCTC’s notification and consultation activities to be undertaken during the preparation of the EAC Application, and subsequently, following submission of the EAC Application for agency and public review and comment.

The proposed notification and consultation activities will comply with:

- the *Public Consultation Policy Regulation* (B.C. Reg. 373/2002) under BCEAA; and
- applicable government policies regarding consultation with First Nations.

2.1 Overview of Public, First Nations and Government Consultation

- Provide a summary of the objectives for information distribution (notification) and consultation.
- Indicate how access to Project information has been and will be accomplished, and how BCTC has and will respond to comments and issues raised.
- Indicate how comments raised from the public, First Nations, and a regulatory agency has been integrated into the overall planning and design of the Project.
- Describe any overlapping consultation activities, interests, and issues resulting from the CPCN process required to satisfy British Columbia Utilities Commission (“BCUC”) requirements under the *Utilities Commission Act*.

2.2 Notification and Consultation Initiatives Undertaken

- Describe the efforts undertaken to distribute Project material to the public (including key stakeholder groups), First Nations, and regulatory agencies during preparation of the EAC Application.
• Summarize direct consultation activities undertaken during the preparation of the EAC Application, including meetings with community representatives, and local government within the Corporation of Delta (including Tsawwassen), on Galiano and Salt Spring Islands, and within the District of North Cowichan.

• Summarize direct consultation activities undertaken during the preparation of the EAC Application to formally notify and consult with First Nations.

• Prepare a tabulated summary/record to document issues and concerns raised by the public, First Nations, and regulatory agencies during the preparation of the EAC Application, organized by discipline.

• Describe how issues and concerns raised by the public, First Nations, and regulatory agencies have been incorporated into the planning and design of the Project and the EAC Application.

• Document relevant communication and consultation agreements/protocols between First Nations and BCTC.

2.3 Planned Notification and Consultation Activities

• Outline BCTC’s proposed public and First Nations notification and information dissemination and consultation programs to be undertaken during the formal “public comment period” (to be scheduled within the 180-day regulatory review period) following submission of the EAC Application.

• Identify methods of public and First Nations consultation to be undertaken during the public comment period including community meetings, and presentations.
3.0 REVIEW OF ALTERNATIVES

CEAA requires consideration of “alternatives to” a project for all screening studies under Section 16(1)(e) of CEAA. The Canadian Environmental Assessment Agency’s Operational Policy Statement OP2-EPO/2 (1998)\(^1\) provides clarification with respect to the application of Section 16(1)(e) with respect to the consideration of alternatives to a project.

The analysis of alternatives to the Project will describe the process that BCTC has used to comparatively evaluate construction methodologies and undertakings based on environmental, engineering, and economic considerations. The level of assessment will reflect the appropriate nature of the "alternatives to" the Project at this stage of the process, and why the alternatives were discarded from further consideration. The result of the analysis of alternatives will serve to rationalize why the Project is the preferred means of achieving the overall project objectives of increasing system reliability and meeting current and future electricity demand on Vancouver Island.

The EAC Application will also address “alternative means of carrying out” the Project that are technically and economically feasible. In selecting routes and technical alternatives for evaluation, BCTC has considered routing options, technical design features, construction techniques, and other parameters to define a preferred project alternative. A review of design concepts and routing alternatives has been assembled and considered in a high-level review as referenced in BCTC’s Certificate of Public Convenience and Necessity (CPCN) Application, which is available at http://www.bctc.com/regulatory/applications/Vancouver+Island+Transmission+Reinforcement+Project+CPCN+Application.htm. This screening analysis has been conducted to reduce the broad range of potentially feasible alternatives to a manageable list for further comparison by identifying those alternatives that are clearly preferred to other potential solutions.

Once a manageable list of project alternatives was identified, cost estimates and comparative analyses between these alternatives were developed at different levels of details, as required, to eventually identify a preferred alternative. Primary considerations at this stage of the analysis included technical performance, reliability, all aspects of project costs (including energy efficiency, capital costs, O&M costs), environmental effects, community impacts, First Nations interests, implementation risks, regulatory risks, and any other significant factors. Figure 4-4 and Figure 4-5 in the CPCN Application provides a short list of route alternatives developed through this identification, screening, and analysis process. Further refinements to the preferred alternative such as alignment adjustments will be considered during the environmental assessment, permit applications, and development of a detailed design and final alignment.

3.1 Alternatives to the Project

- Describe technically and economically feasible “alternatives to the Project” that have been considered to be consistent with the above-referenced CEA Agency’s Operational Policy Statement.
- Analysis of “alternatives to the Project” and the rationale for the preferred alternative as a reasonable approach to meeting the need and purpose, and which is consistent with the aims of CEAA.

3.2 Alternative Means of Carrying out the Project

- Describe technically and economically feasible “alternative means of carrying out the project”. These include:
  1. Evaluation of alternative transmission line and submarine cable crossing alignments, including right-of-way variations;
  2. Evaluation of alternative routings in the Tsawwassen area;
  3. Evaluation of placing portions of the transmission lines underground;
  4. Evaluation of alternative transmission line support structures, span lengths, and heights;
  5. Evaluation of alternative techniques and methods for installing the new submarine cable, including trenching, hydro-jetting, horizontal directional drilling, and other burial techniques to
ensure system security in view of seismic and anchor damage risks;
6. Evaluation of alternative techniques and methods for decommissioning, removing, and disposing of the existing submarine cables and overhead transmission line;
7. Evaluation of the environmental effects and risks of abandoning the existing submarine cables in place, rather than removing and disposing of the cables; and
8. Evaluation of alternative station locations.

- **Describe the tiered approach for evaluating the “Alternative means of carrying out the project”**:
  - Prepare an evaluation matrix of the range of possible alternative means;
  - Evaluate the alternatives based on engineering, environmental, cultural, socioeconomic, and health criteria;
  - Prepare a brief rationale of why certain alternatives are not considered technically and/or economically viable, and why they are not being considered further; and
  - From the remaining alternatives, select the preferred Project alternative upon which the detailed environmental assessment of potential effects will be undertaken.

### 3.3 **Summary of Preferred Alternative**

- Provide a concise rationale for selection of the preferred alternative, based on the criteria, upon which the environmental assessment will be based.
4.0 PROJECT DESCRIPTION

This Chapter will describe the Project facilities and the activities associated with the construction, operation and decommissioning of the Project, including construction procedures, maintenance activities, schedule, and the removal of the existing overhead transmission lines and submarine cables. BCTC will consult with the BCEAO and CEA Agency to confirm the scope of issues to be addressed during each of the Project phases.

Sufficient detail will be provided to allow meaningful assessment of potential Project effects to be conducted. Ancillary activities necessary to complete the Project will be included.

4.1 Existing Infrastructure

Prepare a general overview description of the existing transmission line system between the mainland and Vancouver Island.

4.1.1 Existing 138 kV System – Overhead Components and Substations

- Provide a general description of the existing 138 kV overhead transmission line system, including photographs.
- Indicate why the existing system does not allow BCTC to provide reliable and sufficient transmission service to Vancouver Island.
- Provide a general description of the existing substations, including photographs.
- Identify tenures associated with the existing overhead components and substations, including when they were acquired and the land use at that time.
- Identify any constraints or problem areas along the existing overhead transmission line corridor, such as animal-caused outages, which may have implications for the design or implementation of the Project.
- Identify constraints that will need to be considered during the engineering and design of replacements and upgrades of the
transmission line facilities and substations. These include constraints related to such issues as seismic conditions, space limitations, management of hazardous materials, drainage conditions, history of previous spills, history of animal/rodent issues, etc.

4.1.2 Existing 138 kV System – Submarine Components and Terminals

- Provide a general description of the existing submarine cable system across Georgia Strait and Trincomali Channel, including why the existing system does not allow BCTC to provide reliable and sufficient transmission service to Vancouver Island.
- Provide a general description of each of the four existing cable terminals (English Bluff, Taylor Bay, Montague Harbour, and Maricaibo), including photographs.
- Identify tenures associated with the submarine cables and cable terminals, including when they were acquired.
- Identify any constraints or problem areas along the existing submarine cable corridor, which may have implications to the design or implementation of the Project.
- Identify any constraints that will need to be considered during the engineering and design of modifications and upgrades of the submarine cables and cable terminals. These include constraints related to such things as seismic conditions, space limitations, management of hazardous materials, drainage conditions, history of previous spills, history of animal/rodent issues, etc.

4.2 Project Components and Infrastructure

- Provide an overview description of the Project components and infrastructure.
- Descriptions of the proposed works are to be supported by plans, drawings, figures, orthophotos, etc. to depict each of the major project components.
4.2.1 Transmission Lines and Substations

- Describe the proposed transmission line system configuration, including numbers and types of structures, span lengths, height, right-of-way widths, conductor configuration, access requirements, lighting requirements, etc.
- Describe the location of the proposed transmission line system including the modifications to the substations, in relation to rights-of-way.
- Describe the proposed substation modifications required to accommodate the new circuits, including the addition of phase shifting transformers, shunt reactors, circuit breaker, and other equipment as required.

4.2.2 Submarine Cables and Cable Terminals

- Describe the attributes of various cable insulation alternatives, including the benefits of the preferred cable design.
- Describe chemical characteristics of the proposed insulating fluid, including toxicity on fish.
- Provide a summary of submarine cable designs used in other jurisdictions for similar projects.
- Refer to Section 7.2.2 for evaluation of potential effects on marine fish and invertebrates during operation and maintenance of the new submarine cables.
- Refer to Section 7.4.2 for evaluation of potential effects on marine aquatic plants, including eelgrass (zostera marina and zostera japonica).
- Describe construction procedures at each of the four cable terminals.
- Determine area (in square metres) of footprint of disturbance and cable terminal boundaries within 30 m from top of bank of high high water mark (HHWM).
4.3 **Construction Activities, Plan and Schedule**

- Discuss construction methodologies and sequencing for each of the transmission line and submarine cable components.
- Describe proposed schedules, activities, and milestones related to construction of the Project.
- Prepare a construction schedule diagram/flow chart identifying major tasks and timelines.

4.4 **Transmission Lines and Substations**

- Describe construction procedures for installing the transmission line structures and stringing of the lines, including clearing requirements along the right-of-way. These include, but are not limited to, access road upgrading, right-of-way clearing and site preparation, possible equipment laydown and storage areas, underground construction, transmission line structure foundation construction, conductor installation, transmission line installation, decommissioning and removal of the existing overhead transmission line, site reclamation and restoration. Describe construction activities at the substations, including installation of the phase shifting transformers.
- Indicate whether there are segments of the transmission line system which will require specialized crossing structures or construction techniques (i.e. such as over Montague Harbour and Sansum Narrows), and in areas of seismic risk such as within the Ladner and Tsawwassen areas of Delta.
- Identify areas where new access roads will be required to facilitate structure installation and/or stringing of the transmission lines, and possible equipment laydown and storage areas.
- Identify any timing restrictions/constraints with respect to activities such as in-stream works (i.e. watercourse crossings), tree clearing (i.e. nesting seasons), and audible noise within urban areas.
• Prepare a detailed schedule of the construction sequencing for the replacement of the transmission lines, including the modifications to the substations.

4.5 **Submarine Cables and Cable Terminals**

• Describe proposed cable-laying techniques and methods leading from each of the cable terminals into the marine foreshore and subtidal areas. This includes, but is not limited to, site preparation and development of temporary access requirements for working within the marine foreshore and intertidal areas, modifications of cable chaseways, cable installation and burial, submarine cable-laying, removal of the existing submarine cables, and site restoration and enhancement.

• Describe methods and processes for removal of existing nitrogen containment systems, installation of new cable termination footings, lighting, arrestor footings, insulating fluid pressurizing system footings, insulating fluid containment systems, cable chase shoring and sunshades, and other miscellaneous improvements, and site restoration.

• Describe the specialized equipment and shipping infrastructure required for cable laying and removal.

• Describe proposed measures to protect the cables from natural and un-natural hazards and processes. These include, for example, cathodic protection from corrosion, burial within the seabed for protection from seismic activity and anchor damage and application of articulated split pipe cable protectors.

• Prepare a detailed schedule, including an estimate of time, of the construction sequencing for the removal and installation of the new submarine cables.

4.6 **Capital Costs**

• Provide a total capital estimate of Project costs broken down by major project components.
4.7 **Labour Force**

- Estimate construction workforce requirements (direct jobs only) for each of the transmission line and submarine cable components.
- Indicate where the construction workforce would originate from.
- Estimate operation/maintenance workforce requirements (direct jobs only) for each of the transmission line and submarine cable components.
5.0 **SCOPE OF ENVIRONMENTAL ASSESSMENT PROCESS AND PROCEDURES**

The EAC Application will identify and assess the potential effects that may result from the Project, and will recommend mitigation measures for managing those effects. In general, the assessment will include four main elements:

- Opportunities for interested parties, including First Nations, to identify issues and to provide meaningful input regarding site-specific knowledge and perspectives on land and resource uses along the transmission corridor;
- Technical studies of the relevant environmental, social, economic, heritage, and health effects of the Project;
- Identification of ways to prevent or minimize undesirable effects and to enhance desirable effects; and
- Consideration of the input of all interested parties in compiling the assessment findings and making informed decisions about Project acceptability.

BCEAA and CEAA establish frameworks for preparing environmental assessments. The scope, procedures, and methods of each assessment are tailored to the biological and physical conditions and cultural/socio-economic resources of the Project area. This allows each assessment to focus on the issues that are relevant to the nature and scope of the Project.

To meet the requirements of Sections 16(1) of CEAA, and Part 3 of BCEAA, the assessment must consider potential environmental effects associated with the construction, operation, and decommissioning activities associated with each of following major components of the Project:

- Transmission Lines and Substations
- Submarine Cables and Cable Terminals

For the purposes of the EAC Application, construction related effects include those associated with the dismantling and decommissioning of the existing 138 kV infrastructure, as well as the construction activities associated with the new infrastructure.
Due to the long-term nature of the operational phase of the Project, which would typically be 60 years or greater, the EAC Application will not include a detailed evaluation of the potential effects associated with the dismantling or decommissioning phase of the new infrastructure. However, BCTC will commit to preparing a Decommissioning Plan as part of the EAC Application and as a condition of approval. It is anticipated that a separate environmental assessment will be required prior to the eventual dismantling and decommissioning of the new infrastructure to evaluate potential effects, based on resource values, public interests, characteristics, and legislative requirements at that time. The Decommissioning Plan will need to be reviewed and updated with relevant agencies and First Nations as necessary, reflective of these considerations prior to the dismantling and decommissioning phase of the new infrastructure.

The scope of the assessment will consider the potential effects of the Project on the following environmental features, conditions and resources:

- Geophysical Environment, including physiography, topography, soils and geology, hydrogeology and groundwater, water quality, and hydrological considerations;
- Atmospheric Environment, including climate, winds, precipitation, and air quality;
- Marine Aquatic Environment, including aquatic habitats and resources, threatened and endangered species that are federally listed under Schedule 1 of the *Species at Risk Act* (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), as well as provincially listed red- and blue-listed species by the BC Conservation Data Centre (CDC);
- Freshwater Aquatic Environment, including aquatic habitats and resources, threatened and endangered species that are federally listed under Schedule 1 of SARA and COSEWIC, as well as red- and blue-listed species by the CDC;
- Terrestrial Environment, including vegetation, wildlife, and threatened and endangered species that are federally listed under
Schedule 1 of SARA, COSEWIC as well as red- and blue-listed species and plant communities by the CDC;

- First Nations Issues, including aboriginal interests and the current and historical traditional uses of lands and resources for traditional purposes;
- Archaeological and cultural resources (physical and cultural heritage);
- Agricultural land and resources, including within the Agricultural Land Reserve (ALR);
- Parks and recreational resources including Montague Harbour Park and the proposed Southern Strait of Georgia National Marine Conservation Area;
- Aesthetics and viewsheds;
- Navigation issues, particularly with respect to installation of transmission lines over navigable waters (Montague Harbour and Sansum Narrows), and removal and installation of submarine cables within Georgia Strait and Trincomali Channel;
- Land Use, including effect on private and Crown lands, residential, institutional, commercial/industrial, and potential for environmental contamination from current and previous land uses;
- Public health and safety, electromagnetic field effects (EMF), navigation and traffic hazards; and
- Socio-Economic Conditions, including local and regional economies, including employment, housing, property values, government revenues, emergency support services, and noise.

A cumulative environmental effects assessment will be provided as described in Chapter 12.0, consistent with Section 16(1)(a) of CEAA, to evaluate the potential effects of the Project in combination with other projects or activities that have been or will be carried out.

The EAC Application will indicate the study boundaries to be used for each component of the Project, and will include an explanation of the rationale adopted for establishing study boundaries.
Technical studies within the defined study areas will take into account the timeframes over which the effects originating from the construction and operation of the Project are anticipated to occur.

Spatial (space) boundaries will be based on the zone of the Project influence beyond which the potential environmental, cultural, and socio-economic effects of the Project are expected to be non-detectable. It may be possible to simplify the process of study area definition by identifying separate study areas for the biophysical/environmental effects, socio-economic/community effects, and First Nations issues. For the biophysical portion of the environmental assessment, most of the effort is likely to focus on characterizing resources within the immediate Project footprint within the marine and terrestrial environments, where potential biophysical effects may be detectable.

Spatial boundaries for assessing Socio-economic/Community effects are broader than the immediate footprint of the Project to take into consideration potential effects on factors such as existing land uses (residential, agricultural, institutional, commercial, parkland), aesthetics and viewsheds, and public health.

Spatial boundaries for assessment of potential effects on First Nations will be determined based on the extent to which there is interference with the exercise of First Nations interests.

5.1 **Scope of Environmental Assessment**

- Provide a description of how the issues (geophysical, biological, cultural, socio-economic, etc.) were scoped based on a technical perspective for each of the following major components of the Project:
  - Transmission Lines and Substations
  - Submarine Cables and Cable Terminals
5.2 **Study Area Boundaries**

- Provide a description and rationale of the study areas (spatial boundaries) to be employed for each of the technical disciplines for each of the following major components of the Project:
  - Transmission Lines and Substations
  - Submarine Cables and Cable Terminals
- Prepare a series of maps/drawings to depict the study area boundaries for each of the technical disciplines for each of the major Project components.
- Describe the timeframes for conducting the assessments for each of the technical disciplines.
6.0 **BASELINE, POTENTIAL EFFECTS ASSESSMENT AND MITIGATION: TRANSMISSION LINES (LAND PORTION) AND SUBSTATIONS**

This Chapter of the EAC Application will describe and evaluate potential “environmental effects”, and recommend mitigation measures to minimize adverse environmental effects associated with construction, operation and decommissioning of the land portions of the transmission lines and modifications to the existing substations.

The environmental description and characterization will be based on a review of available information and data sources, site investigations, as well as consultation with regulatory government agencies, First Nations, and public stakeholders. Refer to Chapter 2.0 for Public and First Nations consultation activities to be undertaken during preparation of the EAC Application.

Chapter 7.0 of the EAC Application will describe and evaluate environmental effects and recommend mitigation measures associated with the construction and operation phases of the submarine cables and cable terminals.

Chapters 6.0 and 7.0 of the EAC Application will be consistent with Section 16(1) of CEAA, which requires an assessment of the “environmental effects” of the Project. “Environmental effects” are defined in Section 2(1) of CEAA as follows:

“(a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act;

(b) any effect of any change referred to in paragraph (a) on

i. health and socio-economic conditions,

ii. physical and cultural heritage,

iii. the current use of lands and resources for traditional purposes by aboriginal persons, or

iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.”

Chapter 8.0 of the EAC Application will identify and evaluate potential effects of the environment on the Project, as referenced in subsection (c) of the definition of “environmental effect.”

6.1 **Geophysical Environment**

6.1.1 **Baseline**

(1) **Physiography and Topography**

- Provide a description of the terrestrial physiography and topographic features for the Project area, including within the lower Fraser Delta, across Galiano and Salt Spring Islands, and on Vancouver Island in North Cowichan, B.C.
- Provide a description of key terrain features, including hills, watercourses, wetlands, and agricultural farmland within the Project area.

(2) **Soils and Geology**

- Provide a description of bedrock and surficial geology characteristics, including geotechnical and soils/stability information along the transmission corridor.

(3) **Surface Water Quality**

- Summarize available baseline information on ambient water quality conditions within each of the watercourses along the transmission corridor. Include all watercourses within the Project area, as well as those that may be crossed or potentially
affected during construction access to the transmission line.

- Compare baseline water quality parameters with appropriate guidelines and standards, such as the Canadian Council of Ministers of the Environment for Protection of Freshwater Aquatic Life, and British Columbia Approved Water Quality Criteria.

(4) **Surface Water Hydrology**

- Provide a description of hydrological flow regimes for each of the watercourses, including ditches, along the transmission corridor.

(5) **Hydrogeology and Groundwater**

- Provide a description of the hydrogeological and groundwater conditions along the transmission corridor.

(6) **Winds**

- Provide a description of the predominant wind conditions, including direction, velocity, and seasonal variations within the Project area. This information will be used to assess potential effects of the environment on the Project, as discussed in Chapter 8.0.

(7) **Precipitation**

- Provide a summary of available data and trends to document annual precipitation (rain, snow, fog) conditions applicable to the Project area.
- Identify data sources and locations of precipitation recording stations. This information will be used to
assess potential effects of the environment on the Project, as discussed in Chapter 8.0.

6.1.2 Assessment of Potential Effects

- Evaluate potential effects of increased sediment and erosion along transmission corridor and at the substations due to construction and operation activities. Include potential effects due to right-of-way clearing and excavation during construction, and right-of-way maintenance during operation.
- Evaluate potential for induced slope failures along the entire transmission corridor, due to construction and operation activities.
- Evaluate potential hydrological effects of diverting surface watercourses (including ditches), if applicable, to facilitate access during construction and operation along the transmission corridor and at the substations.
- Evaluate potential effects on water quality during removal of the existing 138 kV overhead transmission line, and subsequent construction and operation of the new transmission line, and modifications at the substations.
- Identify potential effects on water quality during initial clearing and site preparation, excavation for foundation construction, concrete placement, construction site access and contractors' laydown and staging areas.
- Identify areas of potential concern due to high water table elevations during site access development, right-of-way clearing, and foundation excavation for transmission structures and modifications at the substations.
- Identify potential effects to water quality on fisheries resources and community water supply systems due to steep terrain, unstable slopes, and high silt-content soils.
- Identify potential effects on water quality during operation of the transmission line due to vegetation management activities (i.e., application of herbicides, pesticides, mechanical removal of vegetation, etc.).
6.1.3 Mitigation Measures

- Recommend best management procedures for maintaining water quality within watercourses along the transmission corridor and at the substations.
- Identify types and locations of sediment and erosion control measures, such as silt fences, straw bales, gravel check dams, etc. to be used during construction and operation of the transmission line, and modifications at the substations.
- Identify procedures for controlling release of concrete and other cementitious materials associated with the construction and curing of the foundations for the transmission line structures and substations.
- Recommend design and construction mitigation measures for managing groundwater and de-watering procedures during excavations for transmission structure foundations, and at the substations.
- Recommend procedures for minimizing potential for inducing slope failures during clearing and excavation activities, particularly along steep sections of the transmission corridor.
- Recommend procedures for maintaining water quality and unrestricted flows within watercourses along the transmission corridor, associated with site access requirements during construction and operation of the transmission line and at the substations. Identify locations where temporary and/or permanent culverts or bridges may be required.

6.2 Fish and Aquatic Habitat

6.2.1 Baseline

- Describe freshwater aquatic habitat and fisheries resources along the transmission corridor. This includes all watercourse crossings including ditches within Delta (Ladner and Tsawwassen), on Galiano and Salt Spring Islands, and on Vancouver Island.
• Map locations of watercourse crossings along the transmission corridor, and where vegetation clearing and other construction activities will be required within 30 m of any wetland, lake, marine shoreline, etc. Include any dry or intermittent ditch or stream.
• Review existing data sources including the Corporation of Delta’s watershed and watercourse maps, and the Fisheries Information Summary System (FISS) administered by DFO.
• Characterize existing fisheries resources within each of the watercourses along the transmission corridor, including those creeks and streams that will need to be crossed to facilitate construction access.
• Identify critical and sensitive habitats for spawning and rearing by fish and invertebrate populations.
• Identify in-stream work windows and sensitive times of the year which are critical for resident and anadromous populations of fish for watercourses along the transmission line corridor in consultation with regional fish and wildlife habitat biologists with Fisheries and Oceans Canada (DFO) and the Ministry of Environment (MOE).
• Identify data sources, data collection methods, and habitat surveys referencing appropriate biophysical standards and protocols (i.e. such as standards published by the Resource Inventory Standards Committee, and administered by the Integrated Land Management Bureau) used for characterizing baseline freshwater aquatic habitat and fisheries resources along the transmission corridor, as outlined in the Fisheries Work Plan to be prepared in conjunction with DFO and MOE.
• Identify potential for existence of threatened and endangered freshwater aquatic fish species that are protected under Schedule 1 of SARA.
• Review rare and endangered species lists administered by COSEWIC, and the CDC for red- and blue-listed fish species.
• Conduct field reconnaissance-level surveys as necessary to determine whether watercourses (creeks, streams, lakes, ditches
and wetlands) along the transmission corridor contain suitable habitat for rare and endangered fish species.

6.2.2 Assessment of Potential Effects

- Assess potential effects on fish and fish habitat of construction and operation activities along the transmission corridor, including development of site access roads that may be required to facilitate construction access, transmission line structure removal and assembly, and electrical transmission line installation.
- Determine if the design and construction of the transmission line will result in the “harmful alteration, disruption, or destruction” (HADD) of fish habitat.
- For the purposes of the assessment, the fisheries sensitive zone will be considered as all in-stream and riparian habitats within 30 m top of bank of watercourses, unless otherwise specified by DFO or MOE in consultation with affected First Nations.
- Estimate areas and types of aquatic habitat potentially affected (both temporary and permanent) at each of the watercourse crossings, and where construction activities for the new transmission line are anticipated to encroach within 30 m top of bank.
- Evaluate potential effects on freshwater aquatic habitat, including creeks, streams, wetlands, etc. associated with the modifications (including site access) and operations at the substations.
- Based on the review of available information and field reconnaissance-level surveys, determine risk of potential effects on threatened or endangered fish species within each of the watercourses (creeks, streams, lakes, and wetlands) during construction and operation of the transmission line.

6.2.3 Mitigation Measures

- Recommend design mitigation measures for minimizing, and where possible, avoiding effects to fish and fish habitat, if any, associated
with the location and configuration of transmission structure foundations in consultation with affected First Nations.

- Identify crossing structure requirements along the transmission line corridor to maintain fish passage and/or downstream water quality, during construction and operation of transmission line structures.

- In the event that the transmission structures, or the modifications at the substations will result in the encroachment or “harmful alteration, disruption, or destruction” (HADD) of fish habitat, identify habitat compensation measures to achieve “no net loss” of aquatic habitat, consistent with DFO’s Policy for the Management of Fish Habitat, and the Canada Fisheries Act.

- The habitat compensation measures identified as part of the EAC Application will serve as the basis for a commitment to prepare a Habitat Compensation Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project. The Habitat Compensation Plan will provide details on the areas and types of aquatic habitat to be permanently affected due to the construction and operation of the transmission line, and will be submitted to DFO in support of a Habitat Authorization Agreement under Section 35(2) of the Fisheries Act.

6.3 **Wildlife and Terrestrial Habitat**

6.3.1 **Baseline**

- Describe terrestrial habitat and wildlife resources within the study area to be defined for assessing potential effects on wildlife.

- Describe areas of special ecological importance within the Project area such as the Western Hemisphere Shorebird Reserve Network designation.

- Identify data sources, data collection methods, and conduct wildlife surveys as necessary, referencing appropriate biophysical standards and protocols (i.e. such as standards published by the Resource Inventory Standards Committee, and administered by the Integrated Land Management Bureau, as outlined in the Wildlife
and Terrestrial Habitat Work Plan to be prepared in conjunction with CWS and MOE.

- Confirm wildlife suitability ratings based on habitat mapping exercise, and identification of environmentally sensitive areas such as forested areas and wetlands within the spatial boundaries to be defined for assessing wildlife effects.
- Identify critical and sensitive areas potentially used by wildlife species, including those used for nesting, breeding, and foraging. Map locations of wildlife trees including stick and cavity nests. Identify locations of raptor nests and heron rookeries within the spatial boundaries to be defined for assessing wildlife effects associated with transmission line construction and operations, and modifications at the substations.
- Confirm sensitive times of the year which are critical for nesting and breeding activity, and locations of sensitive habitat in consultation with regional wildlife habitat biologists with the Canadian Wildlife Service (CWS), the Ministry of Environment (MOE), and with affected First Nations.
- Identify potential threatened and endangered wildlife species that are protected under Schedule 1 of SARA.
- Review rare and endangered species lists administered by COSEWIC, and CDC for red- and blue-listed wildlife species.
- Conduct field reconnaissance-level surveys, as necessary, to determine whether suitable habitats exist along the transmission corridor to support rare and endangered wildlife species.

6.3.2 Assessment of Potential Effects

- Evaluate potential effects of construction and operation activities, including development of site access, noise from helicopter and heavy construction equipment on wildlife and wildlife habitats. Evaluate potential effects on nesting, breeding, and foraging habitats along the transmission corridor, and within the vicinity of the substations based on the methods and procedures described in
the Wildlife and Terrestrial Habitat Work Plan to be prepared in conjunction with CWS and MOE.

- Determine the degree to which loss of vegetation is predicted to reduce the availability and quality of browsing opportunities for large mammals, and nesting and breeding habitat for small mammals and birds.
- Evaluate potential for increased wildlife mortalities during construction and operation due to incidents with construction vehicles and machinery, increased potential for predation, line strikes or electrocutions, etc.
- Evaluate potential effects on raptor nests, heron rookeries, snake hibernacula, migratory bird nesting habitat, and other critical habitats associated with the construction and operation activities required along the transmission corridor and at the substations, based on the methods and procedures described in the Wildlife and Terrestrial Habitat Work Plan to be prepared in conjunction with CWS and MOE.
- Evaluate potential risks of bird strikes and electrocutions from the proposed transmission line configurations on local wildlife populations and on migratory bird species.
- Based on the review of available information and field reconnaissance-level surveys as described in the Wildlife and Terrestrial Habitat Work Plan to be prepared in conjunction with CWS and MOE, determine risk of potential effects on threatened or endangered wildlife species during construction and operation of the transmission line, and at the substations.

6.3.3 Mitigation Measures

- Prepare terrestrial habitat mitigation measures to minimize potential effects on wildlife populations based on areas and types of terrestrial habitat (i.e. grassland, forested upland, riparian habitat, and wildlife trees) along the transmission corridor, in consultation with affected First Nations.
• Identify construction windows for scheduling of construction activities that would result in least potential effects on breeding and nesting activities.
• Recommend construction practices to minimize disturbance and harassment to wildlife species.
• Delineate critical habitats (such as wildlife trees, caves, nests, etc.) along the transmission corridor for protection during construction and operation of the transmission line.
• Prepare site restoration and re-vegetation measures to re-establish disturbed wildlife habitats, if any, and to minimize potential for invasion of non-native vegetation.
• Recommend practical opportunities for enhancement and creation of wildlife habitats, as required, which will not conflict with operation requirements of the transmission line.
• The terrestrial habitat mitigation measures will serve as a basis for a commitment to prepare a Wildlife Resource and Habitat Mitigation Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.

6.4 Vegetation Resources

6.4.1 Baseline

• Identify data sources, data collection methods, and surveys to delineate vegetation units, and to assess potential effects on vegetation resources along the transmission corridor, as described in the Vegetation Work Plan to be prepared in conjunction with MOE.
• Prepare base maps to delineate vegetation units within the Project area using modified Terrestrial Ecosystem Mapping (TEM) methods developed by the Resource Inventory Standards Committee, as described in the Vegetation Work Plan to be prepared in conjunction with MOE.
• Determine vegetation units (ecosystem polygons) along the transmission corridor based on aerial photographs, Forest Cover...
Maps, Islands Trust Ecosystem Mapping data, and available BC Hydro data.

- Select areas of potential habitat for rare plants to focus the survey effort based on available Predictive Ecosystem Mapping (PEM).
- The transmission corridor will be centered on the transmission line and will be used to assess impacts from the project activities. The width of the transmission corridor will be the right-of-way in urban areas, and up to a 100 m buffer from each edge of the right-of-way in rural areas, as described in the Vegetation Work Plan to be prepared in conjunction with MOE.
- Identify areas within the along the transmission corridor where there are existing areas of invasive noxious weeds and non-native, invasive vegetation, such as Scotch Broom.
- Record vegetation types and percent cover as it relates to growth and transmission clearance requirements.
- Identify potential for existence of threatened and endangered vegetation species and plant communities that are protected under Schedule 1 of SARA.
- Review rare and endangered species lists administered by COSEWIC, and CDC for red- and blue-listed vascular plant, mosses, lichens, and plant communities.
- Evaluate suitability of site conditions along the transmission corridor to support rare and endangered plant species and plant communities based on field reconnaissance-level surveys. As described in the Vegetation Work Plan to be prepared in conjunction with MOE, undertake a rare plant survey in the late spring (mid to late May) to capture early flowering plants, and again in the late summer (August) to capture late flowering plants, grasses and sedges.
- Confirm locations of red- and blue-listed species and plant communities where possible, including but not limited to, Garry Oak/Arbutus plant communities.
• Delineate locations in urban areas along the Project right-of-way where vegetation has been planted and is managed by private landowners, using available orthophotos.

6.4.2 Assessment of Potential Effects

• Provide an estimate (in hectares) of each type of vegetated area (i.e. grassland, forested upland, riparian habitat, urban vegetation, and wildlife trees) of new clearing along the transmission corridor, and at the substations.

• Evaluate temporal effects (i.e. time lag) for re-establishment of vegetation along the transmission corridor following completion of the construction for the new transmission line, and modifications to the substations.

• Evaluate potential effects on the proliferation of non-native invasive weed species (such as Himalayan blackberry, Scotch Broom, etc.) during construction and operation of the transmission line, and modifications at the substations.

• Evaluate fire hazard risk to the nearby communities and land uses resulting from invasive weeds (particularly Scotch Broom), accumulation of slash, and other fuel sources along the right-of-way.

• Determine if threatened or endangered plant species and plant communities will be potentially affected by the construction or operation of the new transmission line, and modifications at the substations.

• Evaluate the extent and types of threatened or endangered plant species and communities that may be potentially disturbed, altered, or removed during the construction or operation of the new transmission line, and at modifications at the substations.

• Determine if sensitive plant communities, such as Garry Oak/Arbutus plant communities, will need to be removed or pruned to facilitate construction and operation of the new transmission line.
6.4.3 Mitigation Measures

- Recommend vegetation management practices and applications along the right-of-way which minimize clearing or the requirement for herbicides and pesticides, in consultation with affected First Nations.
- Recommend vegetation management practices and applications along the right-of-way which minimize risks of potential wildlife fire hazards, as referenced in Chapter 8.0.
- Identify long term strategies for controlling invasion of Scotch Broom and accumulation of slash along right-of-way, as way of reducing potential wildfire hazard risk.
- These measures will serve as a basis for a commitment to prepare a Vegetation Management Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.

6.5 Archaeological and Cultural Resources

6.5.1 Baseline

- Conduct a review of the Provincial Heritage Register, administered by the Archaeology and Registry Services Branch of the Ministry of Tourism, Sport and the Arts, to determine locations and characteristics of recorded archaeological sites within the vicinity of the Project area.
- Review other available databases of recorded archaeological and cultural.
- Conduct an Archaeological Overview Assessment (AOA) to evaluate potential locations for effecting as-yet unrecorded heritage resources and artifacts in the vicinity of the Project area.
- Based on the AOA, develop a scope of work for conducting an Archaeological Impact Assessment (AIA).
- The scope of work for conducting the field inventory and assessment for the AIA will be undertaken in two stages. During
the first stage, the AIA will include areas along the Project corridor identified as having moderate or high archaeological site potential as determined during the AOA, with the exception of private lands along the portion of the right-of-way between the Tsawwassen Substation and English Bluff Terminal (i.e. the proposed underground portion). The first stage of the AIA will also include publicly-owned lands (i.e. BC Hydro-owned lands and municipally owned lands) along the portion of the right-of-way between the Tsawwassen Substation and English Bluff Terminal. The results of this stage of the AIA will be included in the EAC Application.

- A separate workplan will be prepared to include archaeological field investigations along portions of the right-of-way on private lands between Tsawwassen Substation and English Bluff Terminal (i.e. the proposed underground portion). The results of these remaining field inventory and assessment investigations along this portion of the right-of-way will be reported separately, after issuance of a Certificate of Public Convenience and Necessity (CPCN), but prior to construction along this portion of the right-of-way.

- Typically, an AIA would include procurement of a Heritage Inspection Permit under Section 14 of the Heritage Conservation Act from the Archaeology and Registry Services Branch, coordination of field investigations with local First Nations, subsurface investigations, analyses, and preparation of an AIA report.

- Evaluate the legislative protection status of any identified sites to determine whether they are protected under the Heritage Conservation Act or other legislation.

### 6.5.2 Assessment of Potential Effects

- Based on the Archaeological Impact Assessment (AIA), identify archaeological and cultural resources potentially affected during construction and operation of the new transmission line, and modifications at the substations.
Identify need for Systematic Data Recovery (SDR) studies at any significant sites which have been assessed during the AIA as unavoidable by the Project, and where completion of additional excavation for investigation may be warranted.

Facilitate procurement of a Site Investigation Permit(s) under Section 14 of the *Heritage Conservation Act* to undertake excavations for Systematic Data Recovery (SDR) studies evolving from the AIA.

Include detailed summaries of SDR reports either within the EAC Application, or alternatively, following issuance of the Environmental Assessment Certificate prior to ground disturbing activities, as a condition of Project approval.

Based on the AIA (Heritage Inspection Permit) and SDR studies (Heritage Investigation Permit), identify need for Site Alteration Permit(s) under Section 12 of the *Heritage Conservation Act* from the Archaeology and Registry Services Branch of the Ministry of Tourism, Sport, and the Arts to authorize disturbance of protected archaeological sites which have been found unavoidable by the Project.

Commit to obtaining Site Alteration Permit(s) under Section 12 of the *Heritage Conservation Act* following issuance of the Environmental Assessment Certificate prior to ground disturbing activities.

Consult with, and involve First Nations, in efforts to protect identified archaeological and heritage resources.

6.5.3 Mitigation Measures

If necessary, determine which archaeological or cultural resources can be protected through design mitigation and avoidance measures in consultation with affected First Nations.

Prepare archaeological protection measures to be implemented if required during construction and operation of the transmission line and substations in consultation with affected First Nations.
• The archaeological protection measures identified as part of the EAC Application will serve as the basis for a commitment to prepare an Archaeological Impact Management Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.

• The Archaeological Impact Management Plan would include, among other things, detailed procedures and protocols for archaeological monitoring of ground disturbing activities at protected sites.

6.6 **Land Use**

6.6.1 **Baseline**

• Provide a description of the land use planning context for the Project area, recognizing that most Project activities would be undertaken within an existing right-of-way.

• Describe general land uses and designations along the transmission corridor, referencing applicable land use regulations and Official Community Plans (OCPs) administered by local governments (including municipalities, regional districts, and the Islands Trust).

• Confirm locations of existing Environmentally Sensitive Areas (ESAs) and Development Permit Areas (DPAs), as defined and mapped by each of the local governments along the transmission corridor.

• In consultation with these local governments, identify other sites of sensitivity within and outside of DPAs that each of the local governments may have designated, or are proposing to designate.

• Delineate urban, agricultural, institutional, commercial, industrial, First Nation reserves, parks, ecological reserves, and other protected areas in the Project area.

• Delineate properties along the transmission corridor that are held or covenanted by the Islands Trust Fund, or by the Local Trust Committees in the Islands Trust Area.
• Identify areas of active logging, mining (including gravel extraction), and shipping in the Project area.
• Identify locations of other utility corridors and rights-of-way including, but not limited to, those for natural gas, telecommunications, public highways and roads in the Project area.
• Describe existing land uses in residential backyards, municipal parks, and school grounds in urban areas, based on review of available orthophotos.
• Identify any Crown and private land requirements for the Project, including any right-of-way acquisition or lands required for construction access along portions of the transmission line corridor, and at the substations.

6.6.2 Assessment of Potential Effects

• Evaluate areas where construction and operation of the transmission line will encroach or potentially effect Environmentally Sensitive Areas (ESAs) and/or Development Permit Areas (DPAs).
• Describe the potential effects of the Project on existing land uses in residential backyards, municipal parks, and school grounds in urban areas, based on the review of available orthophotos.
• Evaluate potential effects and constraints of acquiring additional property or right-of-way, if any, for the transmission line.

6.6.3 Mitigation Measures

• Recommend measures to minimize potential effects on Environmentally Sensitive Areas (ESAs) and Development Permit Areas (DPAs) designated by local governments during removal of the existing 138 kV transmission line, and construction and operation of the new transmission line and substations.
• Identify key commitments to mitigate adverse effects on land uses within the Project area during construction and operation of the transmission line and the substations. Reference the more detailed mitigation measures, as described in the subsequent sections on
agriculture, parks and recreation, aesthetics and viewsheds, navigation, transportation and utilities, and socio-economic.

6.7 **Agriculture**

6.7.1 **Baseline**

- Identify segments of the transmission corridor that are within the Agricultural Land Reserve (ALR). These areas will require an application under the *Agricultural Land Commission Act* to the Agricultural Land Commission (ALC) for the construction and replacement of structures, poles, guys, and other related infrastructure on ALR lands within the existing right-of-way, or any new rights-of-way.
- Identify types of existing agricultural crop production along the transmission corridor.
- Identify Workers Compensation Board (WCB) Regulations, and/or other applicable health and safety requirements, relating to agricultural operations and maintenance activities under transmission lines.

6.7.2 **Assessment of Potential Effects**

- Evaluate areas where construction and operation activities may affect agricultural land uses including grazing and crop production.
- Evaluate potential effects on agricultural production based on proposed timing and methods of construction activities. Describe methods used to install new transmission line structures and conductors, including where helicopter construction may be necessary.
- Evaluate potential effects on crops and farm worker safety during construction and operation of the facilities.
- Evaluate potential for induced or stray voltage in wire trellis systems used to support crops.
6.7.3 Mitigation Measures

- Recommend periods of the year during which construction activities should be planned and scheduled to minimize effects on planting, harvesting, grazing or other agricultural operations.
- Recommend measures to minimize potential effects on agricultural operations due to helicopter operations.
- Recommend communication protocols to notify agricultural landowners in advance of scheduled construction activities, so that farmers can plan their planting, harvesting, grazing or other agricultural operations accordingly.
- Recommend measures to minimize or reduce potential for induced or stray voltage.
- Recommend structure locations to minimize potential effects on agricultural operations.

6.8 Parks and Recreation

6.8.1 Baseline

- Delineate locations of municipal, provincial, and federal parks and reserves in the Project area including Montague Harbour Marine Park on Galiano Island, and proposed Southern Strait of Georgia National Marine Conservation Area.
- Provide a description of existing upland and marine-based recreational and tourism activities within the Project area.

6.8.2 Assessment of Potential Effects

- Identify potential constraints and effects with respect to parks, ecological reserves, and other protected areas in the vicinity of the transmission line and substations, including Montague Harbour Marine Park and proposed Southern Strait of Georgia National Marine Conservation Area.
- Evaluate potential effects of construction and operation activities on recreational opportunities, such as recreational boating, diving,
nature-based tourism, hiking, horseback riding, hunting, mountain biking, and other sporting activities.

- Determine potential effects of loss of access or quality of recreational experience due to right-of-way clearing, and/or presence of project facilities.
- Determine potential effects of loss of tourism within the Project area, particularly on Galiano and Salt Spring Islands, during construction and operation of the transmission line.

6.8.3 Mitigation Measures

- Recommend strategies for minimizing potential disturbances to protected areas, such as Montague Harbour Marine Park and the proposed Southern Strait of Georgia National Marine Conservation Area, during construction and operation of the structures and transmission lines.
- Recommend opportunities and constraints for allowing compatible recreational uses such as hiking, horseback riding and mountain biking along the transmission corridor, and recreational boating within Montague Harbour and Sansum Narrows.
- Recommend strategies for minimizing potential effects on recreational activities and tourism opportunities within the Project area during construction and operation of the transmission facilities.

6.9 Aesthetics and Viewsheds

6.9.1 Baseline

- Provide a description of viewsheds and landscape features within the Project area, including within the communities along the right-of-way.

6.9.2 Assessment of Potential Effects

- Describe study methods and survey techniques for predicting changes to landscapes, and viewsheds.
• Evaluate potential changes to the existing viewsheds, during construction and operation of the transmission line. This may include, but is not limited to, potential changes to aesthetics and viewsheds within rural and urban areas along the transmission corridor due to structure height, conductor size, type and visibility, span length, etc.

6.9.3 Mitigation Measures

• Identify opportunities and recommend methods for minimizing the effect on existing viewsheds, important landscape features, and aesthetic characteristics within communities along the transmission corridor.

6.10 Navigation

6.10.1 Baseline

• Describe locations of aerial transmission line crossings over waterbodies and watercourses. These include Montague Harbour and Sansum Narrows, but may also include smaller watercourse crossings.
• Describe vessel use (commercial and recreational) within all waterbodies that have aerial crossings.
• For each aerial crossing, provide a drawing consistent with Transport Canada’s requirements under the *Navigable Waters Protection Act*, including watercourse name and number (if applicable), crossing width, height to the transmission wires measured from high high water mark (HHWM), depth of the water, latitude and longitude, height and location of the structures.

6.10.2 Assessment of Potential Effects

• Evaluate whether construction and operation of the transmission line and structures could interfere with navigation.
6.10.3 Mitigation Measures

- Identify engineering design standards and criteria for maintaining specified height requirements of transmission lines above navigable waters (i.e. Montague Harbour and Sansum Narrows). Document and confirm clearance height requirements for proposed new transmission line above high high water mark (HHWM), relative to existing 138 kV transmission lines.
- Recommend optimal timing periods of the year for undertaking construction activities to reduce potential effects on recreational and commercial vessels within navigable waters, during construction along the transmission corridor.
- Comply with regulatory requirements for notification to shipping, and maintaining marine traffic communication protocols consistent with the requirements of Transport Canada, and other agencies having jurisdiction.
- Comply with regulatory requirements for identification of all aerial crossings over navigable waterways to minimize potential for conflict with marine navigation and aircraft.

6.11 Transportation and Utilities

6.11.1 Baseline

- Describe locations of existing and proposed transportation corridors intersected by the transmission corridor. Include a map and description showing locations of existing and proposed public roads, highways, and railways.
- Describe locations of existing airports and flight paths within the Project area, including for example, Boundary Bay Airport and float plane docks.
- Describe locations of existing utilities including telecommunication facilities, water mains, sanitary and storm sewers, and natural gas and oil transmission and distribution pipelines which are parallel to, or intersected by the transmission corridor.
6.11.2 **Assessment of Potential Effects**

- Evaluate suitability of existing public roads, highways, and railways to accommodate access and egress of construction traffic in the Project area.
- Evaluate potential effects on traffic during construction, including temporary road closures, detours, and disruption of access to private properties within residential areas.
- Evaluate potential conflicts and constraints, with constructing and operating the transmission line within the vicinity of airports and landing strips in Delta (including Boundary Bay Airport), on Galiano Island, Salt Spring Island, and on Vancouver Island.
- Evaluate potential constraints to be managed during construction associated with working alongside and in the vicinity of other utilities including, but not limited to, natural gas, oil, telecommunication cable, sanitary and storm sewer, and water supply infrastructure.

6.11.3 **Mitigation Measures**

- Delineate locations of other utilities along the transmission corridor to avoid potential effects during construction and operation of the new transmission line.
- Comply with applicable regulatory requirements for notifying transportation authorities and other utilities of construction and operation activities.
- Identify mitigation measures required to avoid conflicts, including potential public safety hazards, associated with the construction and operation of the transmission line.
- Recommend public notification and communication measures to advise local residents of possible safety hazards and public safety precautions during construction and operation of the transmission line.
6.12 Contaminated Sites Potential

6.12.1 Baseline

- Provide a summary of historical land uses and activities in the Project area, as a basis for determining potential sources of “onsite” and “offsite” contamination (i.e., “onsite” refers to potential sources of contamination on the right-of-way, while “offsite” refers to adjoining properties and activities which may be generating contaminants).
- Review available historical aerial photographs, the Contaminated Sites Registry maintained by the Ministry of Environment (MOE), and other information sources as necessary, conduct site surveys, and interview BC Hydro and BCTC staff familiar with historical property uses and activities to determine the likelihood of encountering potential sources of contamination.
- Conduct a reconnaissance-level survey of the existing wood poles and cross arms along the transmission line right-of-way to document types of wood treatment and preservatives used.
- Identify locations of potentially contaminated soils due to the existing treated wood poles along the transmission right-of-way.

6.12.2 Assessment of Potential Effects

- Evaluate risk of potential environmental contamination in the vicinity of the transmission line and substations due to historical and current land uses. Particular attention will be made at the structure foundation and wood pole locations, where soil excavation and handling will be required.
- Evaluate potential risk of groundwater contamination based on nature of materials handled and stored at substations, and adequacy of secondary containment structures.
- Evaluate potential risk of soil contamination due to treated wood poles and cross arms along the transmission line right-of-way, based on visual evidence of hydrocarbon staining.
• Evaluate potential risk of soil contamination due to leaching potential from the creosote- and/or polychlorinated phenol (PCP) treated wood poles.

• Determine if soil sampling and chemical characterization is required at specific wood pole locations along the transmission corridor to verify the presence/absence, and extent of potentially contaminated soils.

6.12.3 Mitigation Measures

• Recommend areas where chemical characterization of soils and groundwater media may be required to adequately assess potential for encountering contaminated soils during removal of the existing wood poles and cross arms, excavation for structure foundations, and modifications at substations.

• Recommend locations along the transmission corridor and at the substations where soils and/or groundwater remediation may be required due to site contamination.

• Recommend protocols for management and handling of contaminated soils and groundwater either via onsite in-situ remediation or offsite disposal, in the event that it is determined there is a risk of encountering contaminated soils during excavations for the new transmission line and modifications at substations.

• Recommend strategies for disposing, reusing, or recycling treated and non-treated wood poles. Refer to existing applicable standards or procedures administered by BCTC and/or BC Hydro.

6.13 Socio-Economic Environment

6.13.1 Baseline

• Document existing population distribution, demographics, and social profiles within the municipalities and regional jurisdictions (including Islands Trust) along the transmission corridor, including those
associated with both the land-based and marine-based portions of the Project.

(1) Housing

- Provide a description of existing housing and accommodation supply, indicating where construction trade workers and substation crews may stay during construction.
- Determine whether cable installation and removal crews would be provided accommodation directly on the cable-laying and cable-removal ships, or whether regular shuttle services would be provided to transport crews from the ship to the nearest local communities.
- Determine accommodation needs for the submarine cable installation and removal crews based on workforce needs (direct employment) and economic spin-offs.
- Identify if there will be additional accommodation requirements for cable installation and removal crews on scheduled days off within the local communities.

(2) Property Values

- Provide a range in residential property values along and adjacent to the existing right-of-way.

(3) Government Revenues

- Summarize current government revenues associated with the existing transmission facilities from the Arnott Substation to the Vancouver Island Terminal along 1L17/18.

(4) Public Support and Emergency Services
• Provide a brief description of existing emergency support services, such as emergency response (fire, ambulance, police), hospitals, and medical facilities, available to respond and support to an emergency related construction and operation of the transmission line.
• Provide a brief description of existing emergency support services, such as emergency response (fire, ambulance, police), hospitals, and medical facilities, available to respond and support to an emergency related to the cable-removal and cable-laying activities.

(5) Radio Interference Noise

• Characterize existing radio interference noise levels associated with existing 138 kV transmission line and other sources in each of the communities and jurisdictions within the Project area.

6.13.2 Assessment of Potential Effects

• Identify construction and operation/ maintenance costs of the Project including capital costs by major project components, labour, and government taxes (including sales, income, and property taxes).

(1) Housing

• Evaluate predicted accommodation needs for the construction crews based on work force needs (direct employment) and economic spin-offs compared with baseline conditions in each of the communities traversed by the Project.
(2) **Property Values**

- Describe effects of construction and operations on private land and property market values.
- Evaluate potential effects of the Project on residential property market values along the right-of-way, due to the transmission line, and modifications at the cable terminals and substations.

(3) **Government Revenues**

- Evaluate potential change in government revenues due to employment, expenditures, and taxes (i.e. sales tax, income tax, property taxes) associated with construction and operation/maintenance of the Project, based on estimates of capital costs and labour force requirements (Refer to Sections 4.6 and 4.7).

(4) **Public Support and Emergency Services**

- Evaluate the adequacy of local emergency response services including fire, ambulance, police, hospitals, and medical facilities to address potential emergency situations during construction and operation of the transmission line.
- Evaluate the adequacy of local emergency response services including fire, ambulance, police, hospitals, and medical facilities to address potential emergency situations during installation and operation of the submarine cables, and during construction and operation at the cable terminals.
- Consider emergency preparedness and response capabilities, personnel, and technical resources of these services.
• Determine potential security risks due to vandalism, terrorism, and/or other non-natural hazards during construction and operation of the transmission line, and substations. This includes during dismantling and removal of the existing infrastructure.

• Determine potential security risks due to vandalism, terrorism, and/or other non-natural hazards during removal, installation, and operation of the submarine cables and cable terminals.

• Recommend increased security measures that may be required.

(5) Radio Interference Noise

• Evaluate potential effects of the Project on radio interference noise in the Project area.

6.13.3 Mitigation Measures

• Recommend health and safety measures to be implemented during construction and operation of the land-based and marine-based portions of the Project, to minimize requirements for provision of emergency response services from local communities and jurisdictions.

• The health and safety measures to be included as part of the EAC Application will serve as the basis for a commitment to prepare a Health and Safety Plan following receipt of the Environmental Assessment Certificate prior to construction.

• Recommend increased site security and public safety measures that may be required during construction and operation of the Project.

• Recommend design mitigation and operational measures to reduce effects on property values along the right-of-way. These will include, but will not be limited to, consideration of alternative means of undertaking the Project (as referenced in Section 3.2), re-vegetation, and site restoration along the right-of-way.
• Recommend design mitigation strategies to minimize potential for increases to radio interference noise.

6.14 Public Health

6.14.1 Baseline

Public Health Parameters
• Provide a description of baseline factors affecting the public health settings in the communities within the Project area. These include potential effects on public health due to audible noise, electromagnetic fields, domestic water quality and supply (including groundwater wells), and air quality as described below.

(1) Audible Noise

• Characterize audible baseline noise levels in each of the communities and jurisdictions within the Project area.
• Summarize the nature of previous audible noise concerns raised by the public as related to the operation and maintenance of the existing transmission lines and substations.
• Summarize the nature of previous audible noise concerns raised by the public as related to aircraft operations along the transmission corridor.

(2) Electromagnetic Fields

• Describe EMF levels within and along the edge of the existing right-of-way and at the substations and cable terminals based on both modelling and actual readings.
• Describe range of typical EMF exposures for the general public from other sources.

(3) Domestic Water Quality and Supply
• Review the groundwater well database, maintained by MOE, of registered private wells (both private and commercial) within the Project area.

• Review available data regarding a joint groundwater supply project undertaken by the Islands Trust and Natural Resources Canada.

• Identify areas along the transmission corridor that receive domestic water supplies from groundwater wells.

• Review available maps maintained by MOE to describe and characterize the aquifers within the Project area. Identify whether the aquifers are confined, unconfined, within bedrock, and/or are within sand and gravel deposits.

• Review the Provincial Aquifer Classification System to describe potential vulnerability of the aquifers within the Project area to contamination.

• Based on available information from existing groundwater data, describe typical time-of-travel estimates, transmissivity rates, and hydraulic gradients for groundwater movement in the aquifers within the Project area.

(4) **Air Quality**

• Provide a summary of ambient air quality levels to characterize baseline air quality conditions in each of the communities and jurisdictions in the Project area.

• Identify potential emission sources to be used during construction and operation activities for the transmission line and modifications at the substations. Potential air emission sources may include use of portable generators for construction, and/or use of emergency generators for alternative power supply.
• Identify sources of air emissions and potential air quality effects from other industries and activities in the Project area.

6.14.2 Assessment of Potential Effects

• Evaluate potential for increased audible noise related to the construction and operation of Project facilities, relative to ambient background noise levels.
• Evaluate potential for increased audible noise from operation of the transmission lines under various atmospheric conditions (e.g., rain or fog).
• Summarize the present state of scientific and public health research data, conclusions and policy statements with respect to potential health effects from exposure to EMF at power frequencies.
• Evaluate potential changes in EMF exposure levels associated with the Project relative to the existing baseline setting.
• Provide existing and future estimated EMF levels at key receptors closest to the right-of-way, such as schools and day care facilities.
• Provide diagrams that show existing and predicted EMF levels within and near the right-of-way and how the levels would change.
• Assess potential effects of EMF on public health based on voltage and current increases in conjunction with proposed equipment and structure locations, cable burial depths, structure heights and wire or cable configurations.
• Evaluate potential effects on groundwater supply wells associated with construction and operation activities along the transmission corridor and at the substations, based on typical time-of-travel estimates and hydraulic gradients for groundwater movement in the aquifers within the Project area.
• Evaluate potential vulnerability of domestic groundwater supply wells and community water supplies (including reservoirs) to contamination associated with the construction and operation of the new transmission line and modifications at the substations.
• Evaluate potential for effects on air quality during construction of overhead transmission lines from construction machinery and from fugitive dust during right-of-way clearing and site preparation.

6.14.3 Mitigation Measures

• Recommend design features, construction methods and operational measures to reduce negative effects on public health, if any, along the transmission corridor.

• Recommend mitigation measures to be undertaken during removal of the existing transmission lines, construction and operation of Project facilities to control excessive noises, based on best management practices and applicable noise bylaws and Workers Compensation Board (WCB) requirements.

• Design conductors, conductor support hardware, and other exposed energized parts to reduce corona and associated audible noise, as much as practical.

• Describe design mitigation measures to be implemented to reduce EMF levels. These may include, for example, configuration of wires or underground cables and phase spacing on the structures, structure heights, and structure locations within the right-of-way for overhead lines or location, configuration and depth of burial for underground cables.

• Describe design mitigation measures to be taken to minimize potential for electrostatic shocks to persons in or adjacent to the right-of-way. These may include grounding of structures, fences or other metallic objects near the line.

• Discuss on-going communications to the public regarding the established state of scientific and health research data, conclusions and public policy with respect to EMF exposure at power frequencies.

• Recommend aquifer protection measures, including initiatives to control the handling, storage and transportation of dangerous goods within the capture zone of groundwater wells and community water
supply systems during construction and operation activities along the transmission corridor and the substations.

- Recommend mitigation measures to be undertaken during construction of the Project to control generation of fugitive dust and air emissions from construction machinery, based on best management practices and applicable air emission bylaws.

### 6.15 First Nations Interests

#### 6.15.1 Baseline

- Prepare a general overview to identify First Nations potentially affected by the terrestrial portion of the Project, and their asserted traditional territories.
- Undertake a literature search and carry out consultations with First Nations to confirm which First Nations have an interest in the Project area.
- Provide an overview of First Nations’ traditional and contemporary land and resource uses for each of the interested First Nations that may be affected by the Project.
- Determine and manage confidential information by mutual agreement with relevant First Nations, or as required by law.
- The Section 11 Order by the EAO provides for the establishment of Technical Working Groups or other advisory mechanisms. If required, a working group for First Nation traditional socioeconomic uses could be established and an information protocol regarding the confidentiality of traditional uses established.
- Provide an overview of non-confidential places or features of cultural significance to First Nations that may be affected by the Project.
- Document aboriginal interests identified by First Nations in the vicinity of the Project area through consultation.
- Document fisheries, wildlife, plants and vegetation resources that are of interest and importance to First Nations within the Project area.
6.15.2 Assessment of Potential Effects

- In cooperation with First Nations, evaluate potential effects of constructing and operating Project facilities on each affected First Nation’s ability to continue to carry out traditional cultural, spiritual, and subsistence practices,
- Traditional and contemporary land and resource uses may include, but are not necessarily limited to, hunting, fishing, gathering, and spiritual activities.

6.15.3 Mitigation Measures

- In consultation with affected First Nations, recommend measures to avoid, minimize, mitigate, or otherwise accommodate, if appropriate, the effects of the Project on traditional uses and aboriginal interests along the transmission corridor and at the substations.
7.0 **BASELINE, POTENTIAL EFFECTS ASSESSMENT AND MITIGATION: SUBMARINE CABLES AND CABLE TERMINALS**

The general format and organization of this Chapter of the EAC Application will be similar to Chapter 6.0, and will identify and evaluate potential environmental effects and recommend mitigation measures associated with the construction and operation of the submarine cables and modifications to each of the four cable terminals (EBT, TBY, MTG, and MBO).

The intent of this Chapter is to be consistent with Section 16(1) of CEAA.

7.1 **Geophysical Environment**

7.1.1 **Baseline**

(1) **Physiography and Topography**

- Provide a description of the physical characteristics of the submarine cable corridor, including the intertidal, foreshore and sites where the submarine cable terminals are located.
- Provide a description of the bathymetric features of Georgia Strait and Trincomali Channel within the submarine cable corridor.

(2) **Soils and Geology**

- Provide a description of bedrock and surficial geology characteristics, including geotechnical and soils/stability information within the submarine cable corridor and within the vicinity of the cable terminals.
- Include a description of soil types and potential constraints that will need to be taken into consideration during the removal of the existing 138 kV submarine cables, and construction and operation of the new submarine cables, and cable terminals.
(3) **Marine Water Quality**

- Provide baseline information on ambient marine water quality conditions, including a description of water quality profiles at cable landing sites and any submarine landforms where effects associated with cable removal and installation are likely to occur.

(4) **Oceanographic Conditions**

- Provide a description of oceanographic processes along the submarine cable corridor, including but not limited to, tidal ranges, waves, ocean currents, influence of storms, etc.
- Provide a description of oceanographic considerations as it relates to suspended cables over Galiano Ridge.

(5) **Winds**

- Provide a summary of historical climate data from existing sources (e.g. Environment Canada), supplemented with selected additional onsite measurements.
- Provide a description of the predominant wind conditions, including direction, velocity, and seasonal variations within the Project area in Georgia Strait and Trincomali Channel. This information will be used to assess potential effects of the environment on the Project, as discussed in Chapter 8.0.

(6) **Precipitation**

- Provide a summary of available data and trends to document annual precipitation (rain, snow, fog)
conditions within the Project area in Georgia Strait and Trincomali Channel.

- Identify relevant data sources and locations of precipitation recording stations. This information will be used to assess potential effects of the environment on the Project, as discussed in Chapter 8.0.

### 7.1.2 Assessment of Potential Effects

- Evaluate potential for physical effects on the seabed and foreshore associated with the removal of the existing submarine cables, and construction and operation of the terminals and new submarine cables.
- Evaluate potential for induced submarine slope failures, with resulting water quality impacts, during removal and installation of the submarine transmission cables, and modifications to the cable terminals.
- Evaluate potential for effects on water quality based on alternative construction methodologies, such as water jetting, air-lifting, or plowing, trenching, or horizontal directional drilling, etc.) during removal of the existing submarine cables, and subsequent installation and operation of the new submarine cables within the intertidal and sub-tidal areas.
- Evaluate potential for effects on water quality during modifications to the cable terminals.
- Determine area (zone) over which elevated levels of total suspended sediments, turbidity, and pH would be observed, and resulting potential effects on marine biological resources due to removal and installation of submarine cables.

### 7.1.3 Mitigation Measures

- Identify and recommend engineering design features and construction methods to minimize potential physical effects during
the removal of the existing submarine cables, and construction and operation of the terminals and new submarine cables.

- Recommend procedures for minimizing potential for inducing submarine slope failures during removal and installation of the submarine transmission cables.
- Provide mitigation measures related to the potential use of concrete, thermal cable backfill, and other substances in or near the marine environment.
- Provide details of a monitoring program to measure and report on fluid pressures in the cable system, if relevant, to provide early indication of fluid pressure loss and potential fluid leaks.
- Commit to preparing an Environmental Management Plan for implementing water quality mitigation measures in consultation with affected First Nations, following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.

7.2 **Marine Fish and Invertebrates**

7.2.1 Baseline

- Describe existing fisheries resources within the transmission corridor including Georgia Strait, Trincomali Channel, and Sansum Narrows.
- Identify critical and sensitive habitats for spawning and rearing by fish and invertebrate populations.
- Identify sensitive times of the year which are critical for certain life cycle stages of fish and invertebrate species in consultation with regional fisheries biologists with DFO and other agencies having jurisdiction, and with affected First Nations.
- Identify fishing timing and locations in relation to the transmission corridor and construction activities in consultation with First Nations, sport and commercial fishers.
- Incorporate relevant information gathered for adjacent or nearby development proposals to the Project area.
• Describe study methods, habitat surveys, fish sampling, benthic invertebrate sampling, waterfowl surveys, marine mammal surveys, and results of other marine biological field investigations to be conducted, as outlined in the Fisheries Work Plan to be prepared in conjunction with DFO and MOE.

• Identify potential for existence of threatened and endangered marine fish and invertebrate species that are protected under Schedule 1 of SARA, which could be present in the Project area.

• Review rare and endangered species lists administered by COSEWIC and the CDC for red- and blue-listed marine fish and invertebrate species.

• Undertake field reconnaissance-level surveys and engage in discussions with knowledgeable non-government organizations, agency personnel, and others to determine the presence/absence of favourable habitat for species identified on the above lists which may occur within the Project area.

• Describe estimated EMF levels along the existing 138 kV submarine cable right-of-way.

### 7.2.2 Assessment of Potential Effects

• Evaluate potential effects on marine fish species and invertebrates (including but not limited to dungeness and rock crabs, anthropods, molluscs, bivalves, and cephalopods) during removal of the existing cables, and construction and operation of the new submarine cables, in consultation with affected First Nations.

• Assess potential for effects on marine fish species and invertebrates resulting from habitat loss and alienation, water quality degradation, noise and other physical disturbances during removal of the existing cables, and construction and operation of the new submarine cables.

• Evaluate potential effects on marine foreshore areas as a result of the construction or modifications to the cable chaseways leading from the cable terminals to the intertidal areas, at each of the terminal locations.
• Assess potential effects of construction and operation of the Project on anticipated harvest activities (First Nations, sport and commercial).
• Identify whether the construction and operation of the Project will result in a “harmful alteration, disruption, or destruction” (HADD) of fish habitat.
• For the purposes of the aquatic habitat assessment, the “fisheries sensitive zone” will be considered as foreshore habitats within 30 m top of bank from marine shorelines, unless otherwise specified by DFO or MOE biologists.
• Evaluate potential risks and resulting effects on marine fish species and invertebrates during the operational phase of the Project in the event of a fluid leak from the submarine cables, if relevant.
• Evaluate toxicological risk to marine fish and invertebrates associated with the proposed use of insulating fluid for the new submarine cables. Refer to Section 4.2.2 for an assessment of the attributes of cable insulation alternatives, including a summary of cable designs used for similar projects in other jurisdictions.
• Provide an estimate of insulating fluid volumes, chemical characteristics, and dispersion characteristics due to ocean currents.
• Identify indicator fish and invertebrate species to evaluate toxicity effects on marine aquatic organisms in the event of a fluid leak from the fluid-filled submarine cables, if relevant.
• Evaluate potential changes to EMF exposure levels for marine fish and marine invertebrates.
• Evaluate potential for effects on threatened and endangered marine species during removal of the existing submarine cables, installation and operation of the new submarine cables, and modifications to the cable terminals.
• Identify whether cathodic protection may be proposed to be used at the three cable landings on Galiano and Salt Spring Islands (Taylor Bay, Montague Harbour, and Maricaibo).
• Evaluate potential effects from cathodic protection used for submarine cables on marine organisms and aquatic life including, but not limited to, fish, invertebrates, mammals, and waterfowl.

• Evaluate potential for effects on marine resources associated with long-term deterioration to submarine cables, due to corrosion and damage by physical hazards (including both naturally occurring hazards and damage caused by ship anchors), with resulting increased exposure of electrical currents to marine organisms.

• Provide drawings showing locations (including latitude and longitude) of cathodic protection works located in navigable waterways, required to satisfy Transport Canada’s requirements under the *Navigable Waters Protection Act* (NWPA).

### 7.2.3 Mitigation Measures

• Identify specific mitigation measures required to minimize, and preferably, avoid effects on threatened and endangered marine species and their respective habitats, in consultation with affected First Nations.

• Identify habitat compensation measures to achieve “no net loss” of aquatic habitat, consistent with *DFO’s Policy for the Management of Fish Habitat*, and the Canada *Fisheries Act* based on the extent of “harmful alteration, disruption, and destruction” (HADD) of fish habitat within the intertidal and shallow sub-tidal areas, associated with removal and installation of the submarine cables, and modifications to chaseways from the terminals leading into the intertidal areas.

• Prepare a habitat balance table to summarize and compare total areas and values of temporary and permanent, if any, habitat losses versus gains.

• The habitat compensation measures to be included as part of the EAC Application will serve as the basis for a commitment to prepare a Fisheries Habitat Compensation Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project. The Fisheries Habitat Compensation Plan will
provide details on the areas and types of aquatic habitat to be permanently effected due to removal and installation of the submarine cables, and will be submitted to DFO in support of a Habitat Authorization Agreement under Section 35(2) of the Fisheries Act.

- Identify potential habitat compensation sites and strategies to minimize potential for direct and indirect effects on these marine resources during cable installation and removal.
- Recommend design options for reducing potential for EMF exposure, if any, on marine fish and invertebrates associated with the submarine cables.

7.3 **Marine Birds and Mammals**

7.3.1 **Baseline**

- Describe the diversity of existing marine mammals, waterfowl, shorebirds, sea birds, raptors, herons, and other resources within the submarine cable corridor including Georgia Strait, Trincomali Channel, and Sansum Narrows, with emphasis on the areas of cable terminals, as outlined in each of the Fisheries Work Plan and the Wildlife and Terrestrial Habitat Work Plan to be developed in conjunction with DFO, CWS, and MOE.
- Include a brief description of marine mammal abundance, distribution, and seasonal use within the Project area.
- Identify critical and sensitive habitats for breeding by waterfowl, shorebirds, sea birds, herons, raptors, and marine mammals. Consult with regional fish and wildlife habitat biologists with Canadian regulatory agencies to confirm sensitive times of the year which are critical for certain life cycle stages of marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl.
- Identify potential threatened and endangered marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl that are protected under Schedule 1 of SARA.
• Review rare and endangered species lists administered by COSEWIC, and CDC for red- and blue-listed marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl species.
• Conduct field reconnaissance-level surveys, as necessary, to determine whether suitable habitats exist along the submarine transmission cable corridor to support rare and endangered marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl species.
• Describe estimated EMF levels along the existing 138 kV submarine cable right-of-way.

7.3.2 Assessment of Potential Effects

• Evaluate potential effects on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl during removal of the existing submarine cables and construction and operation of the terminals and new submarine cables. These effects will be evaluated with particular regard to threatened and endangered species protected under Schedule 1 of SARA.
• Assess potential for effects on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl resulting from habitat loss and alienation, water quality degradation, noise and other physical disturbances during removal of the existing submarine cables and construction and operation of the terminals and new submarine cables.
• Evaluate potential effects on wildlife and intertidal foreshore habitats at each of the cable terminals, including those used for nesting, breeding, and foraging.
• Evaluate potential risks and resulting effects on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl during the operational phase of the Project in the event of a fluid leak from the fluid-filled submarine cables, if relevant.
• Evaluate potential changes to EMF exposure levels on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl.
Identify potential habitat compensation sites and strategies to minimize potential for direct and indirect effects on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl during cable construction and operation.

Based on the review of available information and field reconnaissance-level surveys, determine risk of potential effects on threatened or endangered marine mammal, shorebirds, sea birds, herons, raptors, and waterfowl species within the Project area.

7.3.3 **Mitigation Measures**

- Recommend measures to avoid, where possible, potential adverse effects on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl and their respective habitats associated with the construction and operation of the submarine cables and cable terminals. Where avoidance of potential adverse effects is not possible, recommend mitigation measures to minimize effects in consultation with affected First Nations.

- Recommend design options for reducing potential EMF exposure on marine mammals, shorebirds, sea birds, herons, raptors, and waterfowl.

7.4 **Marine Vegetation (Eelgrass and Kelp Beds)**

7.4.1 **Baseline**

- Describe and evaluate the extent and diversity of marine vegetation within the Project area. This includes, but is not limited to, eelgrass and kelp beds.

- Identify potential for threatened and endangered marine vegetation species that are protected under SARA.

- Refer to recent available data, eelgrass surveys, and other environmental assessments such as:
  - Precision Identification, entitled BC Hydro Cable Terminal Eelgrass Assessment English Bluffs, Tsawwassen, Maricaibo,
Salt Spring Island, Montague Harbour, Parker Island, Taylor Bay, Galiano Island, September, 2004;
- Fairbanks Environmental Services Inc., entitled Eelgrass Assessment Point Roberts Right-of-Way 1L17/18, August, 2004;
- Environmental monitoring reports and videos of recent submarine cable repair projects (i.e. High Voltage Direct Current Cable 5 and Cable 9 Repair Projects) undertaken by B.C. Hydro in 2003;
- Deltaport Third Berth Expansion Project EAC Application and supporting technical studies available on the BCEAO website;
- Georgia Strait Crossing (GSX) application to the National Energy Board (NEB) and supporting technical studies, available through BC Hydro’s library;
- Canadian Institute of Scientific and Technical Information (CISTI);
- University of British Columbia Library Catalogue;
- Fisheries and Oceans Canada WAVES catalogue;
- Aquatic Sciences and Fisheries Abstracts;
- Oceanic Abstracts;
- Science Citation Index (Web of Science);
- BIOSIS (Biological Abstracts);
- BC Provincial publications;
- National Technical Information Service (NTIS);
- National Oceanic and Atmospheric Administration (NOAA); and
- Corps of Engineers Library Information online (CELIO – US Army Corps).

- Identify potential for existence of threatened and endangered marine vegetation species that are protected under Schedule 1 of SARA.

- Review rare and endangered species lists administered by COSEWIC, and CDC for red- and blue-listed marine plant species.

7.4.2 Assessment of Potential Effects

- Quantify areas of potential effects on eelgrass beds during removal of the existing submarine cables and construction and operation of
the terminals and new submarine cables (including within the intertidal and shallow subtidal areas).

- Evaluate potential for dendritic channel formation within the intertidal and subtidal areas resulting from removal and installation of the submarine cables.

- Evaluate potential effects on kelp beds during the removal of the existing submarine cables (where removal of cables is recommended), and construction and operation of new submarine cables. The evaluation is to consider area of potential effects, productivity of kelp beds, and identification of habitat compensation sites and opportunities.

- Evaluate risk and degree of potential effects on eelgrass and kelp beds in the event of a fluid release from the submarine cables.

- Evaluate suitability of site conditions within the intertidal and shallow subtidal along the submarine cable corridor, including the cable terminals, to support rare and endangered marine vegetation species.

- Evaluate potential effects on rare and endangered marine plant species and plant communities during the removal of the existing 138 kV submarine transmission cables, and during construction and operation of the new submarine cables (including within the intertidal and shallow subtidal areas).

- Evaluate potential effects on rare and endangered marine plant species and plant communities as listed in Schedule 1 of SARA, and as listed by COSEWIC, and CDC during modifications and upgrades of the cable terminals.

7.4.3 Mitigation Measures

- Identify potential habitat compensation sites and strategies to minimize potential for losses in productivity and diversity of marine vegetation, including eelgrass and kelp beds.

- Evaluate whether the substrate within the intertidal portions of the submarine cable corridor is suitable for re-colonization of eelgrass.
and/or other native species of marine aquatic vegetation (kelp, fucus, etc.).

- Determine whether adjacent eelgrass beds could supply suitable donor stock or could serve as candidate habitat compensation sites.
- Recommend mitigation measures to avoid, if possible, or alternatively, minimize potential for dendritic channel formation within the intertidal and subtidal areas resulting from removal and installation of the submarine cables.
- The marine habitat mitigation measures will be part of a commitment to prepare an Environmental Management Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.

7.5 Archaeological and Cultural Resources

7.5.1 Baseline

- Conduct a review of the Provincial Heritage Register, administered by the Archaeology and Registry Services Branch of the Ministry of Tourism, Sport and the Arts, to determine locations and characteristics of recorded archaeological sites in the Project area, and conduct an Archaeological Overview Assessment (AOA). Refer to Section 6.5.1.
- Based on the AOA, develop a scope of work for conducting an Archaeological Impact Assessment (AIA).
- Typically, an AIA would include procurement of a Heritage Inspection Permit under Section 14 of the Heritage Conservation Act from the Archaeology and Registry Services Branch, coordination of field investigations with local First Nations, investigations, analyses, and preparation of an AIA report.
- Conduct a review of available information to identify potential for development conflicts with underwater heritage shipwrecks within Georgia Strait and Trincomali Channel, as defined under Section 13(2)(e) of the Heritage Conservation Act.
• Obtain available recorded underwater shipwreck data in consultation with the Underwater Society of British Columbia and/or the Vancouver Maritime Museum.

• Evaluate the legislative protection status of any identified sites to determine whether they are protected under the *Heritage Conservation Act* or other legislation.

### 7.5.2 Assessment of Potential Effects

• Evaluation will be based on the Archaeological Impact Assessment (AIA), identify heritage resources, artifacts, and underwater heritage shipwrecks potentially affected during the removal of the existing submarine cables and construction and operation of the terminals and new submarine cables.

• Consult with, and involve First Nations, in efforts to protect identified archaeological and heritage resources.

• Identify need for Systematic Data Recovery (SDR) studies at any significant sites which have been assessed during the AIA as unavoidable by the Project, and where completion of additional excavation for investigation may be warranted.

• Facilitate procurement of a Site Investigation Permit(s) under Section 14 of the *Heritage Conservation Act* to undertake excavations for Systematic Data Recovery studies evolving from the AIA.

• Include detailed summaries of SDR reports either within the EAC Application, or alternatively, following issuance of the Environmental Assessment Certificate prior to ground disturbing activities, as a condition of Project approval.

• Based on the AIA (Heritage Inspection Permit) and SDR studies (Heritage Investigation Permit), determine which archaeological sites or heritage resources will need to be, and/or can be removed from the intertidal foreshore and shallow subtidal areas to avoid effects.

• Identify need for Site Alteration Permit(s) under Section 12 of the *Heritage Conservation Act* from the Archaeology and Registry
Services Branch of the Ministry of Tourism, Sport, and the Arts to authorize disturbance of protected archaeological sites which have been found unavoidable by the Project.

- Commit to obtaining Site Alteration Permit(s) under Section 12 of the *Heritage Conservation Act* following issuance of the Environmental Assessment Certificate prior to ground disturbing activities, as condition of Project approval.

### 7.5.3 Mitigation Measures

- Determine which archaeological or heritage resources can be protected through impact avoidance and design mitigation measures in consultation with affected First Nations.
- Prepare archaeological protection measures to be implemented during removal of the existing submarine cables and construction and operation of the terminals and new submarine cables.
- Identify mitigation measures to be taken to minimize effects on underwater heritage shipwrecks during the removal of the existing submarine cables and construction and operation of the terminals and new submarine cables. These measures may include recording of an appropriate level of shipwreck data and/or recovery of associated heritage remains.
- Shipwreck avoidance may be facilitated through the inclusion of an underwater video component during the cable removal and laying operations.
- The archaeological protection measures to be included as part of the EAC Application will serve as the basis for a commitment to prepare an Archaeological Impact Management Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.
- The Archaeological Impact Management Plan would include, among other things, detailed procedures and protocols for archaeological monitoring of ground disturbing activities at protected sites.
7.6 **Navigation**

7.6.1 **Baseline**

- Determine the types and estimated frequencies of marine navigation activities within the Strait of Georgia and Trincomali Channel within the vicinity of the submarine cable corridor. These include, but are not limited to BC Ferries, freighters, commercial fishing vessels, recreational watercraft, etc.

7.6.2 **Assessment of Potential Effects**

- Evaluate potential effects on marine navigation and shipping during installation and removal of the submarine cables.
- Evaluate potential effects on recreational boating and other nearshore recreation activities.

7.6.3 **Mitigation Measures**

- Recommend optimal timing periods of the year designed to reduce potential effects on recreational and commercial vessels within navigable waters, associated with construction activities for the submarine transmission cable.
- Prepare a communication protocol for providing advance notification and advertisements to commercial and recreational marine traffic of the schedule of activities associated with the removal and installation of the submarine transmission cables.
- Comply with regulatory requirements for notification to shipping, and maintain marine traffic communication protocols consistent with the requirements of Transport Canada, and other agencies having jurisdiction.
7.7 **Infrastructure and Utilities**

7.7.1 **Baseline**

- Determine right-of-way locations and types of other utility corridors within the vicinity of the submarine cable corridor. These include, but are not limited to, telecommunication lines, natural gas and oil supply pipelines, and sanitary, storm, and water mains.

7.7.2 **Assessment of Potential Effects**

- Evaluate potential constraints and effects on other utilities including, but not limited to, natural gas, oil, telecommunication cable, sanitary and storm sewer, and water supply rights-of-way associated with removal and installation of the submarine cables.

7.7.3 **Mitigation Measures**

- Delineate locations of other utilities along the submarine transmission cable corridor to avoid potential effects during the removal and installation of the submarine cables.
- Comply with regulatory requirements for notifying other utilities of proposed works and undertakings related to the removal and installation of the cables within the submarine cable corridor including Georgia Strait and Trincomali Channel to avoid conflicts with construction and operation activities.

7.8 **Contaminated Sediments Potential**

7.8.1 **Baseline**

- Review available historical aerial photographs and other information sources as necessary, conduct site surveys, and interview BC Hydro and BCTC staff familiar with historical property uses and activities to determine the likelihood of encountering potential sources of contamination within the sediments, soils, and groundwater during removal of the existing submarine cables and
construction and operation of the terminals and new submarine cables.

- Review available historical data, conduct site surveys, and interview BC Hydro and BCTC staff familiar with historical property uses and activities at the cable terminals to determine likelihood of encountering contaminated soil.

7.8.2 Assessment of Potential Effects

- Evaluate risk of potential soils, sediments, and groundwater contamination within the submarine cable corridor especially at the cable landings and cable terminals due to historical and current land uses.
- Confirm with Environment Canada's Industrial Programs/Ocean Disposal Group on the sampling and analytical protocol for surficial sediment samples that may need to be chemically analyzed in relation to the anticipated volume of materials to be displaced by underwater jetting process for installation of the new cables.
- Where risk of contamination is suspected, prepare and undertake a sampling and analytical program to characterize soils, sediment, and groundwater media, consistent with protocols for a Disposal at Sea Permit established under the Canadian Environmental Protection Act, and/or “Site Investigations” as prescribed under the British Columbia Environmental Management Act.

7.8.3 Mitigation Measures

- Recommend remediation options (including both in-situ treatment and offsite disposal) and protocols for management and handling of contaminated sediments, soils and groundwater based on the Canadian Environmental Protection Act, and/or the Contaminated Sites Regulation (BC Reg. 375/96), under the British Columbia Environmental Management Act.
7.9 Public Health

7.9.1 Baseline

- Provide a description of baseline factors affecting the public health settings in the communities within the vicinity of the cable terminals and nearshore areas of the submarine cables. These include potential effects on public health due to audible noise, electromagnetic fields, domestic water quality and supply (including groundwater wells), and air quality as described below.
- Refer to Baseline data requirements described in Section 6.14 to characterize existing audible noise levels, EMF, water quality and air quality within the communities within the Project area.
- Review the present state of scientific and public health research data, conclusions and policy statements with respect to potential health effects from exposure to EMF at power frequencies.

7.9.2 Assessment of Potential Effects

- Evaluate potential sources of increased audible noise related to the removal of the submarine cables and construction and operation of the submarine cables and cable terminals relative to ambient background noise levels.
- Evaluate potential for increased audible noise levels during operation of hydraulic pumps associated with the cable terminals.
- Evaluate potential audio noise levels associated with the operation of cable-laying and cable-removal vessels, relative to ambient background noises.
- Evaluate potential changes in EMF exposure levels associated with the Project relative to the existing baseline setting.
- Provide existing and future estimated EMF levels at key receptors closest to the right-of-way, such as schools and day care facilities.
- Provide diagrams that show predicted EMF levels within and near the right-of-way and how the levels would change.
• Assess potential effects of EMF on public health based on voltage and current increases in conjunction with proposed cable configurations and equipment locations.

• Evaluate potential effects on groundwater supply wells associated with construction and operation activities based on typical time-of-travel estimates and hydraulic gradients for groundwater movement in the aquifers within the vicinity of the cable terminals, if relevant.

• Evaluate potential vulnerability of domestic groundwater supply wells and community water supplies (including reservoirs) to contamination, associated with the modifications to the cable terminals, if relevant.

• Evaluate potential for effects on air quality associated with exhaust stacks from the cable-laying and cable-removal vessels during installation and removal of the submarine cables, relative to ambient air quality levels.

• Identify potential sources of air emissions during construction and operation of the Project. These may include, but are not limited to air emissions associated with emergency generators for hydraulic pumps and other equipment to provide uninterrupted service of the submarine cables.

7.9.3 Mitigation Measures

• Recommend mitigation measures to be undertaken during installation and removal of the submarine cables and the modifications to the cable terminals to control excessive audible noise, based on best management practices and applicable noise bylaws and Workers Compensation Board (WCB) requirements.

• Describe design mitigation measures to be implemented to reduce EMF levels. These may include, for example, cable configurations and equipment locations at the cable terminals.

• Describe design mitigation measures to be taken to minimize potential for electrostatic shocks to persons in or adjacent to the right-of-way. These may include grounding of structures, fences or other metallic objects near the line.
• Discuss on-going communications to the public regarding the established state of scientific and health research data, conclusions and public policy with respect to EMF exposure at power frequencies

• Recommend aquifer protection measures, including initiatives to control the handling, storage and transportation of dangerous goods within the capture zone of groundwater wells and community water supply systems during construction and operation activities at the cable terminals.

• Recommend mitigation measures to be undertaken during the removal and installation of submarine cables from cable-laying and removal vessels to control generation of air emissions.

• Recommend mitigation measures to be undertaken during construction and operation activities at the cable terminals from construction machinery and from emergency generators based on best management practices and applicable air emission bylaws.

7.10 **First Nations Interests**

7.10.1 **Baseline**

• Prepare a general overview to identify First Nations potentially affected by the submarine cable portion of the Project (including the cable terminals), and their asserted traditional territories.

• Undertake a literature search and carry out consultations with First Nations to confirm which First Nations have an interest in the Project.

• Provide an overview of First Nations’ traditional and contemporary land and resource uses for each of the interested First Nations that may be affected by the Project.

• Provide an overview of non-confidential places or features of cultural significance to First Nations that may be affected by the Project.

• Determine and manage confidential information by mutual agreement with relevant First Nations, or as required by law.
• The Section 11 Order by the EAO provides for the establishment of Technical Working Groups or other advisory mechanisms. If required, a working group for First Nation traditional socioeconomic uses could be established and an information protocol regarding the confidentiality of traditional uses established.

• Document aboriginal interests identified by First Nations in the Project area.

• Document fishing, hunting, and other resource activities that are of interest and importance to First Nations within the Project area.

7.10.2 Assessment of Potential Effects

• In consultation with affected First Nations, evaluate potential effects of removal of the existing submarine cables and construction and operation of the terminals and new submarine cables (including within the intertidal and shallow subtidal areas) on each of the First Nations who’s traditional and contemporary resource uses are located within the Project area.

• Traditional and contemporary resource uses may include, but are not necessarily limited to, hunting, fishing, gathering, and spiritual activities.

• In consultation with affected First Nations, identify and evaluate potential effects of the Project on Aboriginal interests.

7.10.3 Mitigation Measures

• In consultation with affected First Nations, recommend measures to avoid, minimize, mitigate, or otherwise accommodate, if appropriate, the effects of the Project on traditional uses and aboriginal interests along the submarine cable corridor and at each of the cable terminals.
8.0 **EFFECTS OF THE ENVIRONMENT ON THE PROJECT**

This Chapter of the EAC Application is consistent with Section 2(1) of CEAA which defines “environmental effects”, in part, as “any change to the Project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.”

8.1 **Transmission Lines**

8.1.1 **Geophysical Effects**

(1) **Natural Hazard Assessment**

- Evaluate potential effects of natural hazards on the transmission line.
- Based on the soils conditions and geological features along each of the sections of the transmission corridor, evaluate areas of potential seismic risk, slope instability, debris flows, and areas of rockfall hazards.
- Evaluate geotechnically unstable areas along the transmission corridor, as well as at the substations. Identify locations and areas that could potentially affect the integrity of the transmission line such as ravines, gullies, rockfall hazards, and geotechnically unstable areas.
- Evaluate potential for geotechnical hazards and constraints associated with modifications required at substations.

(2) **Mitigation Measures**

- Identify and recommend engineering design features and considerations to minimize potential effects due to unstable soils and natural hazards during construction and operation of Project facilities.
• Recommend design and construction mitigation measures to minimize potential effects on the Project facilities due to natural hazards.
• Identify nature of ground densification works (i.e. vibro-densification, pile driving, etc.) that may be required for underground cables or infrastructure improvements at substations and cable terminals.

8.1.2 Hydrological Effects

(1) Hydrological Assessment

• Identify potential constraints and areas where flooding and seasonally high flows within the watercourses along the transmission corridor will need to be managed during removal of the existing facilities and subsequent construction and operation of Project facilities.
• Evaluate seasonal flows (including peak flows) that can be expected in each of the watercourses along the transmission corridor, and where there may be areas of potential flooding risk to transmission line structures, substations or cable terminals.
• Identify locations of potential flooding risk, and where seasonal flow fluctuations may potentially affect construction procedures, as well as selected location and design of Project facilities.

(2) Mitigation Measures

• Identify and recommend engineering design features and considerations to protect Project facilities from risk of flooding.
• Recommend areas along the transmission corridor where surface watercourses may need to be
temporarily diverted, or otherwise managed, to facilitate construction and operation access.

8.1.3 Wildfire Hazards

(1) Wildfire Hazard Assessment

- Evaluate fire hazard risk to the transmission line infrastructure, and to nearby communities and land uses resulting from invasive weeds (particularly Scotch Broom), accumulation of slash, and other fuel sources along the right-of-way.

(2) Mitigation Measures

- Recommend vegetation management practices and applications along the right-of-way which minimize risks of potential wildlife fire hazards.
- Identify long term strategies for controlling invasion of Scotch Broom and accumulation of slash along right-of-way, as way of reducing potential wildfire hazard risk.
- These measures will serve as a basis for a commitment to prepare a Vegetation Management Plan following receipt of the Environmental Assessment Certificate during the detailed design phase of the Project.
- Recommend control strategies to maintain fire response emergency access along the right-of-way.

8.1.4 Atmospheric Effects

(1) Winds

- Evaluate potential effects of wind on the construction and operation of the Project facilities.
(2) Precipitation

- Evaluate potential effects of precipitation (including ice and snow loading) on the construction and operation of the Project facilities.

(3) Mitigation Measures

- Confirm engineering design and construction criteria and standards in order to minimize effects from extreme wind, snow, and ice events.

8.2 Submarine Cables

8.2.1 Geophysical Effects

(1) Submarine Physiography and Geology

- Identify geotechnically/geologically unstable areas, including seismic fault lines, submarine ridges, and depths of liquefiable soils along the submarine cable corridor in the Strait of Georgia and Trincomali Channel.

- Assess potential constraints to the removal of the existing 138 kV submarine cables, and construction and operation of the cable terminals and new submarine cables as a result of submarine bedrock, ridges, faults, and liquefiable soils along the submarine cable corridor in the Strait of Georgia and Trincomali Channel.

- Assess potential risks to the integrity and security of the cables due to submarine geological or other physical features.

- Evaluate potential for damage to submarine cables due to action of ocean currents along submarine ridges.
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8.2 Submarine Natural Hazards

(2) Evaluate potential risk of natural geological hazards to the submarine cables, including but not limited to, damage by seismic activity, tsunamis, liquefaction, faults, submarine debris flows, etc.

(3) Mitigation Measures

• Describe engineering design mitigation criteria, including burial depths within the intertidal and shallow subtidal areas, and construction methodologies for minimizing potential risk of damage to the submarine cables due to seismic activities and submarine natural hazards.

8.2.2 Oceanographic and Atmospheric Effects

(1) Fog and Visibility

• Evaluate potential risks of effects on navigation in relation to the cable-laying and cable-removal ship(s) due to fog and visibility.

(2) Wind

• Evaluate potential effects caused by wind during removal and installation of submarine cable.

(3) Storms and Tsunamis

• Evaluate the influence of extreme oceanographic factors including, but not limited to, winter storms, tsunamis, tides, waves, ocean currents etc. within Georgia Strait and Trincomali Channel that could adversely affect the removal and installation of the submarine cables.
• Identify potential risks of flooding and storm surges from Georgia Strait and Trincomali Channel to the cable terminals.

(4) Mitigation Measures

• Comply with regulatory requirements for notification to shipping, and maintain marine traffic communication protocols consistent with the requirements of Transport Canada, and other agencies having jurisdiction.
• Recommend a decision protocol (thresholds) for when cable removal and installation activities would be suspended due to extreme atmospheric and oceanographic events.
• Recommend mitigation methods to minimize disturbance/ exposure of submarine cables in and around tidal channels.
9.0 ACCIDENTS AND MALFUNCTIONS

This Chapter of the EAC Application will address potential environmental effects of accidents and malfunctions following implementation of the mitigation measures (i.e. post-mitigation), that may occur in connection with the Project as required by Section 16(1)(a) of CEAA.

9.1 Transmission Lines and Substations

9.1.1 Electrical Hazards and Mitigation

- Identify potential risk of accidents and malfunctions due to electrical hazards to construction personnel and the general public during construction and operation of the transmission lines and substations.
- Identify mitigation measures consistent with industry standard safety procedures and protocols to minimize potential for environmental effects and effects on public safety associated with electrical hazards.

9.1.2 Terrain Hazards and Mitigation

- Identify potential risk of accidents and malfunctions due to terrain hazards and associated construction activities (e.g. right-of-way clearing, tree felling, transmission structure assembly, helicopter construction).
- Identify mitigation measures consistent with industry standard safety procedures and protocols to minimize potential for environmental effects and effects on public safety associated with accidents and malfunctions due to work within steep terrain.

9.1.3 Traffic Hazards and Mitigation

- Identify potential risk of traffic-related accidents and malfunctions to public safety due to requirements to access sections of the right-of-way from public roads and private driveways.
• Recommend procedures and protocols to be implemented to minimize potential conflicts with construction traffic within residential, suburban, and agricultural areas including farming operations.

### 9.2 Submarine Cables and Cable Terminals

#### 9.2.1 Navigation Hazards and Mitigation

• Identify potential for navigation hazards to commercial and private vessels as a result of accidents and malfunctions during operation of cable-laying and cable-removal ships within Georgia Strait and Trincomali Channel.
• Provide recommendations for minimizing risk of navigation hazards during cable-laying and cable-removal operations.

#### 9.2.2 Submarine Non-Natural Hazards and Mitigation

• Evaluate risk of potential effects on submarine cables caused by non-natural hazards, due to ship anchors, commercial fishing gear, etc.
• Recommend mitigation measures to minimize potential effect of non-natural hazards on submarine cables.

#### 9.2.3 Fuel Handling, Storage and Dispensing and Mitigation

• Identify potential risk of fuel and other hazardous material spills as a result of accidents and malfunctions associated with cable-laying and cable-removal activities, and with materials handling at the cable terminals.
• Provide recommendations for minimizing risk of fuel and hazardous material spills through implementation of spill prevention and emergency response procedures.
9.2.4 Mechanical Failure and Mitigation

- Identify potential for effects on marine resources due to accidents and malfunctions associated with mechanical failures of cable burial equipment when working within the intertidal and shallow subtidal areas.
- Identify potential for effects on marine resources due to accidents and malfunctions associated with mechanical failures during cable operation, including potential leaks of insulating fluids.
- Provide details for a spill prevention and emergency response plan related specifically to a break in the submarine cable, and a subsequent release of insulating fluid. Elements of this plan would include, for example, communications including notification and reporting procedures, response and repair procedures, and timelines for detecting and responding to a fluid release into the marine environment.
- Provide recommendations for minimizing risk of accidents and malfunctions due to mechanical failures.
- Describe the maximum volume of insulating fluid potentially released in the event of cable damage.
10.0 ENVIRONMENTAL MONITORING AND FOLLOW-UP

This Chapter of the EAC Application will provide the framework for environmental monitoring and follow-up programs to be undertaken during construction and operation of the Project. As defined by Section 2(1) of CEAA, the objectives of the environmental monitoring and follow-up programs will be to:

a) verify the accuracy of the environmental assessment of the Project; and

b) determine the effectiveness of the measures taken to mitigate the adverse environmental effects of the Project.

For each of the two major Project components (e.g. transmission lines and submarine cables), environmental monitoring programs will be outlined to evaluate the performance of the environmental mitigation and compensation strategies in achieving regulatory compliance, and in minimizing adverse effects.

10.1 Environmental Construction Monitoring

- Describe the framework for an environmental monitoring program to inspect and evaluate the implementation and performance of mitigation measures and habitat compensation strategies to be undertaken during the construction phase of the Project.
- Outline the framework for the reporting mechanisms for the environmental monitoring program, including which agencies and First Nations are to receive copies of environmental reports.
- Outline the framework for communication protocols with landowners.

10.2 Post-Construction Environmental Monitoring

- Describe the framework for a post-construction environmental monitoring program to inspect and report on the survival and productivity of the compensatory habitats to be developed through various means of creation, enhancement, and/or restoration for the terrestrial facilities and submarine cable components of the Project.
Describe BCTC’s program to monitor transmission facilities in the communities along the right-of-way as part of their ongoing operations and maintenance activities throughout B.C.
11.0 SIGNIFICANCE OF RESIDUAL EFFECTS

Assess the “significance” of predicted residual effects after mitigation measures have been applied, as described in the Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects (Canadian Environmental Assessment Agency, http://www.ceaa.gc.ca/013/0001/0008/guide3_e.htm#Reference%20Guide).

Document the methods used to assess the significance of the residual effects.

Residual effects are defined as environmental changes that result from the Project after mitigation measures have been incorporated. As much as possible, the “significance” of residual effects is quantified with an assessment of the level of effect according to defined parameters and evaluation criteria. It is recognized that the final determination of significance rests with the federal Responsible Authorities under CEAA, and with the BCEAO.

It is intended that application of defined criteria will enable a systematic and objective determination of “significance”, which is both defensible and transparent, and which reduces or eliminates biases in deciding the importance of adverse effects following mitigation.

There are broad generic criteria and more specific criteria pertaining to individual environmental components. The generic criteria encompass dimensions such as:

- magnitude (e.g. scale, intensity, spatial extent, frequency, duration);
- direction of change (e.g. positive, negative);
- reversibility/resilience; and
- uncertainty (e.g. degree of confidence, new technology, knowledge limitations).

Significance criteria will be reviewed in consultation with regulatory agencies and affected First Nations.

Refer to: Significance in Environmental Assessment, prepared by Lawrence Environmental for the Research and Development Monograph Series, 2000.
Research supported by the Canadian Environmental Assessment Agency’s Research and Development Program.
(http://www.ceaa.gc.ca/015/0002/0011/index_e.htm).

11.1 Transmission Lines and Substations

- Tabulate and summarize significance of residual effects after mitigation measures have been applied to each of the geophysical, biological, cultural, socio-economic, and public health disciplines.
- Provide a determination that residual effects are either “not significant” or “significant”.

11.2 Submarine Cables and Cable Terminals

- Tabulate and summarize significance of residual effects after mitigation measures have been applied to each of the geophysical, biological (marine), cultural, socio-economic, and public health disciplines.
- Provide a determination that residual effects are either “not significant” or “significant”.
12.0 CUMULATIVE EFFECTS ASSESSMENT

This Chapter of the EAC Application will outline the scope and methodology for conducting a cumulative environmental effects assessment, as required by Section 16(1)(a) of CEAA.

Cumulative environmental effects are broadly defined as effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out, following implementation of the mitigation measures (i.e. post-mitigation).

For example, the following activities and proposed projects will be considered in the cumulative environmental effects assessment:

- Operations and activities at the BC Ferries Tsawwassen Ferry Terminal;
- Shipping activities and movement of goods at the Deltaport Container Terminal and Coal Terminal, including the proposed Third Berth and Terminal 2 Deltaport expansion; and
- Proposed South Fraser Perimeter Road.

Determine whether additional proposed projects and activities should also be included in the cumulative environmental effects assessment.

The following guideline will be referenced when conducting the cumulative environmental assessment:


The cumulative effects assessment will be consistent with the recommended five-step framework outlined in the Cumulative Effects Assessment Practitioners Guide (1999), as follows:
12.1 **Scoping**

- Describe methods used to “scope” the cumulative effects assessment, such as spatial and temporal boundaries used to define which other projects or activities are to be considered.
- Consider only those projects that are considered to be “certain” (the action will proceed or there is a high probability the action will proceed), and “reasonably foreseeable” (the action may proceed, but there is some uncertainty about the conclusion).

12.2 **Analysis of Cumulative Effects**

Describe methods used to determine cumulative effects.

12.3 **Mitigation Measures**

Recommend measures to minimize or preclude cumulative effects, where possible.

12.4 **Evaluation of Significance**

- Determine “significance” of cumulative effects based on implementation of recommended mitigation measures.
- Define “significance criteria” to be used in the determination of cumulative effects.

12.5 **Follow-up Monitoring**

Identify recommended monitoring programs to evaluate effectiveness of mitigation measures in reducing adverse cumulative effects.
13.0 ENVIRONMENTAL MANAGEMENT PROGRAM

The EAC Application will include a framework of the Environmental Management Plan (EMPs) for the Project, to be finalized following completion of the EAC Application as a condition of Project approval. In general, the details of the EMPs will be developed during the detailed design phase of the Project, and in consultation with the relevant permitting agencies and First Nations prior to construction of the Project.

EMPs are documents that describe the environmental practices and procedures to be applied during the construction and operation of the Project. The EMPs will outline BCTC’s approach to project planning and the development of protection measures to mitigate potential adverse environmental and socio-economic effects.

The EMPs may include, but are not limited to the following:

13.1 Construction Environmental Management Plans

- Fisheries Habitat Protection, Mitigation, and Compensation Plan
- Wildlife Resource and Habitat Protection and Mitigation Plan
- Sediment and Erosion Control Plan
- Spill Prevention and Emergency Response Plan
- Construction Waste Management Plan
- Air Quality and Dust Control Plan
- Noise Management Plan
- Archaeological and Cultural Impact Management Plan
- Landscape Design and Site Restoration Plan
- Traffic Safety Management Plan
- Marine Vessel Safety Management Plan
- Health and Safety Plan

13.2 Operational Environmental Management Plans

- Spill Prevention and Emergency Response Plan (including procedures for detecting, responding, notifying, and reporting of
remedial actions in the event of a release of insulating fluid due to a break in the submarine and underground cables);

- Vegetation Management Plan (including control of invasive weeds);
- Wildfire Management Plan; and
- Health and Safety Plan.

13.3 **Decommissioning Management Plan**

The Decommission Management Plan will be prepared prior to future decommissioning activities in accordance with the regulatory regime and environmental sensitivities at that time:

- Environmental Planning and Mitigation Measures,
- Cultural Impact Mitigation Measures,
- Socio-economic Mitigation Measures, and
- Public Health and Safety Procedures.
14.0 CONCLUSIONS AND COMMITMENTS

The EAC Application will provide a clear conclusion of potential adverse environmental, socio-economic, cultural and health effects predicted to occur during construction and operation of the Project. These conclusions will also provide a clear summary of public and First Nations concerns, and how these concerns have been incorporated into the overall design and mitigation measures for the Project.

The conclusions will clearly distinguish potential effects of each of the following Project components:

- Transmission lines and substations, and
- Submarine cables and cable terminals.

The EAC Application will also provide commitments for follow-up monitoring that would be required to evaluate and report on the success of the mitigation measures, habitat compensation plans, and performance of the EMPs to minimize potential adverse effects.

14.1 Conclusions

14.1.1 Transmission Lines and Substations

- Provide a summary of potential environmental effects and recommended mitigation measures, habitat compensation strategies, and EMPs related to the construction and operation of transmission lines and substations.
- Clearly indicate whether this component of the Project is predicted to cause significant adverse environmental, socio-economic, cultural, and health effects.
- Clearly indicate whether there are predicted effects from the environment on the transmission line and substations, such as natural hazards and extreme climatic events.
14.1.2 Submarine Cables and Cable Terminals

- Provide a summary of potential environmental effects and recommended mitigation measures, habitat compensation strategies, and EMPs related to the construction and operation of the submarine cables and cable terminals.
- Clearly indicate whether this component of the Project is predicted to cause significant adverse environmental, socio-economic, cultural, and health effects.
- Clearly indicate whether there are predicted effects from the environment on the submarine cables and cable terminals, such as natural hazards and extreme climatic events.

14.2 Commitments

14.2.1 Monitoring and Reporting

- Summarize commitments for monitoring during construction to evaluate and report on the accuracy of predicted environmental effects and compliance with regulatory requirements and mitigation measures.
- Summarize commitments for post-construction monitoring to evaluate and report on the success of the compensatory aquatic and terrestrial habitats during operation of the Project.

14.2.2 First Nations Consultation

- Summarize commitments made and developed through consultation with affected First Nations during Project development and implementation following Project approval.

14.2.3 Public Consultation

- Summarize commitments derived from consultation with public stakeholders during Project development and implementation following Project approval.
15.0 **LIST OF REFERENCES AND SUPPORTING DOCUMENTATION**

This Chapter will provide a list of references and personal communications cited in the EAC Application.
16.0 APPENDICES

The Appendices will include copies of Technical Assessments, First Nations Consultation Report(s), and Public Consultation Report(s) prepared in support of the EAC Application for the Project.

The Technical Working Groups will be provided an opportunity to comment on the environmental baseline study and assessment programs throughout the pre-application stage as the Proponent’s studies progress.

Prepare a framework for a tabulated summary of Proponent’s Commitments and Assurances, which will consist of an itemized summary of environmental mitigation and monitoring measures to be implemented during detailed design, construction, or operation.
The detailed technical assessments will include, among others:

Appendix I - Biological Assessments

Appendix II – Socio-economic Assessments

Appendix III - Public Health Assessments

Appendix IV - Geotechnical and Geohazards Assessment

Appendix V - Public Consultation Plan and Communications Tracking Log

Appendix VI - First Nations Consultation Plan and Tracking Log

Appendix VII - Proponent’s Commitments and Assurances

BCTC will prepare a tabulated summary of “Proponent’s Commitments and Assurances” for the construction and operation of the Vancouver Island Transmission Reinforcement Project. A draft of the commitments and assurances will be included as part of the EAC Application, and will be modified in response to the comments to be provided by the regulatory agencies, public, and First Nations during the Application review phase.

The Proponent’s Commitments and Assurances will form the basis for the terms and conditions of the Environmental Assessment Certificate, and will comprise a complete listing of all environmental mitigation measures, EMPs, habitat compensation strategies, and monitoring commitments proposed throughout the construction and operation of the Vancouver Island Transmission Reinforcement Project.