

**UNITED STATES OF AMERICA  
BEFORE THE  
DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY**

**BRITISH COLUMBIA TRANSMISSION  
CORPORATION**

)  
)  
) **PRESIDENTIAL PERMIT**  
) **NO. PP-22-4**

**APPLICATION OF BRITISH COLUMBIA TRANSMISSION CORPORATION  
FOR A  
PRESIDENTIAL PERMIT AMENDMENT**

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Pursuant to Section 202(e) of the Federal Power Act, 16 U.S.C § 824(a)(e)(1994), Executive Order 10485, as amended by Executive Order 12038, and the U.S. Department of Energy ("DOE"), Office of Fossil Energy's administrative procedures (10 C.F.R. §205.320, *et seq.*), British Columbia Transmission Corporation ("BCTC" or "Applicant") hereby respectfully files this application for a Presidential Permit Amendment authorizing the construction, connection, operation, and maintenance of facilities for the transmission of electric energy at the international boundary between the United States ("U.S.") and Canada, as more fully described herein ("Application"). A copy of the Presidential Permit PP-22 (originally issued by the DOE in Federal Power Commission Docket No. E-6588, 1955), together with its subsequent amendments, is attached to this Application as Exhibit A (the "Permit"). In support of this Application, BCTC respectfully states as follows:

**1. INFORMATION REGARDING THE APPLICANT**

**1.1 Legal Name of Applicant**

The legal name of the Applicant is British Columbia Transmission Corporation. BCTC is a provincial Crown corporation under the laws of the Province of British Columbia, Canada,

having a principal place of business at Suite 1100, Four Bentall Centre, 1055 Dunsmuir Street, Vancouver, B.C., Canada.

## **1.2 Legal Name of All Partners**

The Applicant has no partners in connection with the Project (as defined below).

## **1.3 Communications and Correspondence**

All communications and correspondence regarding this Application should be addressed to the following:

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Canada  
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Email: bruce.barrett@bctc.com

## **1.4 Foreign Ownership and Affiliations**

BCTC is a provincial Crown corporation, organized and owned by the Province of British Columbia and administered by a government-appointed board of directors for a public purpose. BCTC has the corporate authority to construct, connect, operate, and maintain the Vancouver Island Transmission Reinforcement Project, as more fully described in this Application and the exhibits hereto (the "Project"). The Project's transmission facilities will be owned by British Columbia Hydro and Power Authority, a provincial Crown corporation.

### **1.5 Existing Contracts with Foreign Governments or Foreign Private Concerns**

The Applicant does not have any existing contracts with any foreign (i.e., non-Canadian or non-U.S.) government, or any foreign (i.e., non-Canadian or non-U.S.) private concerns, relating to the Project or to any purchase, sale or delivery of electric energy over the Project's electric facilities. No such contracts with respect to the Project are expected to be entered into in the future, but if any such contracts are entered into before the Project is completed, they will be disclosed to the DOE.

### **1.6 Compliance with Law**

As set forth in an opinion of counsel attached to this Application as Exhibit B, the construction, connection, operation, or maintenance of the proposed transmission facilities described herein is within the corporate powers of BCTC. Further, BCTC has complied with, or will comply with, all pertinent federal and state laws related to the construction, connection, operation, or maintenance of the proposed transmission facilities.

### **1.7 Successor to British Columbia Hydro and Power Authority**

BCTC is the successor of British Columbia Hydro and Power Authority ("BC Hydro") for purposes of the construction, connection, operation and maintenance of the Project. BCTC is a provincial Crown corporation under the provisions of the Business Corporations Act (British Columbia). In 2003, by reason of the Transmission Corporation Act (British Columbia) (the "Act") and agreements entered into by BC Hydro and the Applicant and designated by the Lieutenant Governor in Council pursuant to Section 3(1) of the Act, the Applicant acquired the powers, rights, privileges, concessions and franchises of British Columbia Hydro and Power Authority with respect to the construction, connection, operation and maintenance of the transmission system previously operated by BC Hydro in the Province of British Columbia,

Canada, including the Project. The Applicant respectfully requests the Permit to be amended to name the Applicant as Permittee.

## **2. INFORMATION REGARDING THE TRANSMISSION FACILITIES**

### **2.1 Overview**

BCTC operates three transmission interconnection systems between the mainland of British Columbia and Vancouver Island:

- Two 138 kilovolt (kV) alternating current (AC) circuits installed in 1956 and 1958;
- A 300-kV high voltage direct current (HVDC) system installed in 1969 and 1976; and
- Two 500-kV AC circuits installed in 1983 and 1985.

BCTC is proposing to replace a portion of this system by replacing and upgrading two existing 138 kV circuits with new 230 kV, 600-megawatt (MW) AC infrastructure; one circuit will continue to operate at 138 kV. For the marine portion of the project, only one 138 kV circuit will be replaced with a new 230 kV circuit. New facilities are proposed within an existing transmission corridor that extends from the Arnott Substation in Delta, B.C. to the Vancouver Island Terminal Station north of Duncan, B.C.

The total Project corridor length (in Canada and the U.S.) will be approximately the same as the existing corridor—about 41 miles (66.7 kilometers). The overhead segments of the corridor (all within British Columbia) will total about 24 miles (39.3 kilometers). The submarine cable segments will total about 17 miles (27.4 kilometers) in Canadian and U.S. waters.

A portion of the existing 138 kV transmission system (a set of seven submarine cables in the Strait of Georgia) passes through about 7.5 miles (12 kilometers) of U.S. waters to the west of Point Roberts in Whatcom County. With implementation of the Project, the southernmost three of these seven cables will be replaced.

BCTC is proposing this Project to provide reliable capacity to serve existing demand and future load growth on Vancouver Island.

BCTC is responsible for regulatory and environmental approvals for both the U.S. and Canadian portion of the Project and has filed related documents with the United States Army Corps of Engineers (the "Corps"), which is the designated federal "lead agency" for the environmental determinations with respect to the Project. A copy of the filing of the Joint Aquatic Resources Permit Application (JARPA) filed with the Corps in August 2006 and the correspondence with the Corps, including a March 7, 2007 memorandum to the Corps requesting amendment to the original project description, and a June 2006 letter from the Corps indicating its initial determination that the Project will be authorized under Nationwide Permit 12, are attached to this Application as Exhibit C.

Applications for other U.S. federal, state and local approvals have been filed, and approvals are anticipated in summer 2007. Construction for the portion of the Project in U.S. waters will take place in two phases over the course of approximately one year for expected in-service by October 2008. Cable removal will occur during an approximately two-week period as early as summer 2007, and cable installation will occur during an approximately two-week period in the summer 2008.

## **2.2 Technical Description**

### **Project Work in Canada**

The project will involve the removal of some existing facilities and construction of replacement overhead lines (in Canada) and submarine transmission cables (in Canada and the U.S.) within new and existing rights-of-way as follows:

- Within the Strait of Georgia, three of the existing single-phase 138 kV submarine cables in the southern part of the corridor will be decommissioned and removed and three new 230-kV cables will be installed. The four remaining submarine cables will remain and continue to operate at 138 kV.
- A similar but shorter submarine cable replacement will be performed within Trincomali Channel in Canadian waters between Parker Island and Salt Spring Island.
- On terrestrial portions of the Project, two existing 138 kV single-circuit overhead lines will be removed and replaced with a double circuit 230 kV overhead line. One of the circuits will be connected to the existing submarine cables to remain operated at 138 kV. The other circuit will be connected to the new 230 kV submarine cables and operated at 230 kV.

### **Project Work in the U.S.**

Project work within the U.S. will be confined to about 7.5 miles (12 kilometers) of submarine cable decommissioning and replacement within the Strait of Georgia west of



Point Roberts, Washington. (A technical description of Project work in the U.S. is contained in Section 2.4 below.)

### **2.3 Burial Depth**

The cables will be buried in intertidal and shallow subtidal areas to prevent tripping or snagging hazards to beach users and to prevent cable damage due to currents, tides or boat anchors. In U.S. waters in the Strait of Georgia, the cables will be installed across intertidal mud flats by mechanical water-jetting to a vertical depth of about 3 feet (1 meter) beneath the sea bottom, out to the minus 13.1-foot (minus 4-meter) bathymetric contour, referenced to the vertical survey datum at mean lower low water (MLLW). Each cable will be buried in a separate trench approximately 33 feet (10 meters) apart.

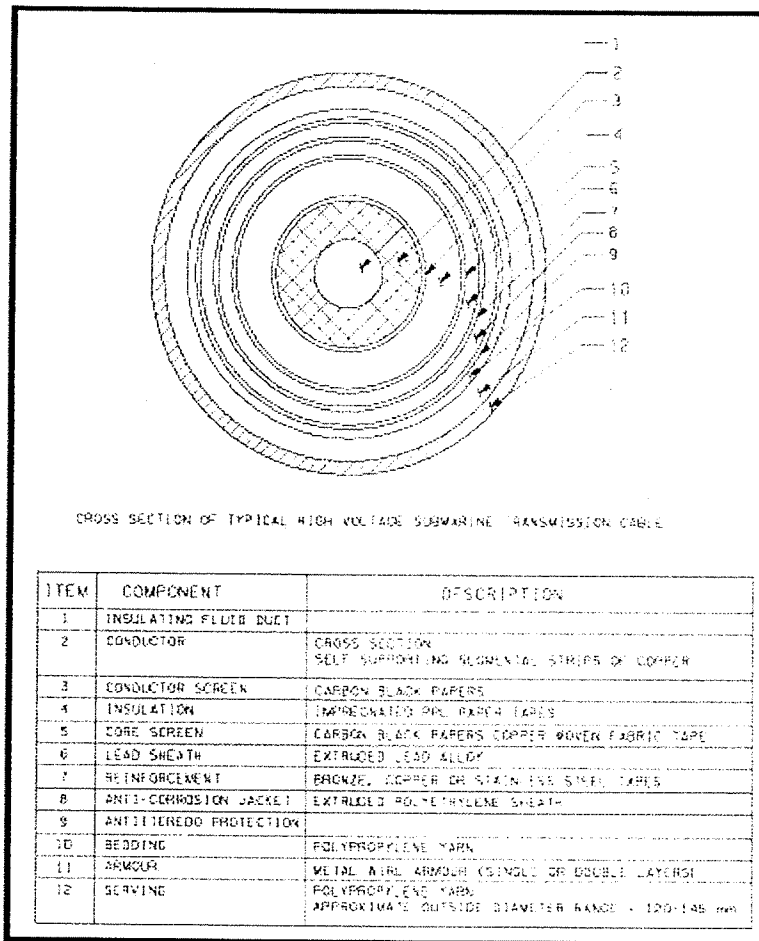
### **2.4 Cable and Ancillary Equipment**

The 230 kV alternating current (AC) circuit will consist of three single-phase submarine cables. The circuit (i.e., a "cable system") will be rated to continuously transfer, in either direction, approximately 600 MW.

- The new submarine cables will be a self-contained, fluid-filled (SCFF) design, in which the cable insulation is pressurized with insulating fluid supplied from the cable terminals. The outside cable diameter will be approximately 125 mm (5 inches). Three cables will be installed to make up one 230 kV AC circuit.
- A cross section of a typical SCFF submarine cable is shown in Figure 1 below. The central stranded-copper conductor is the current-carrying component. Its hollow core provides a passageway for insulating fluid under static pressure provided by equipment at the cable terminals. The insulating fluid saturates the

cable insulation, maintaining the electrical integrity of the cable, and prevents damaging ingress of water in the unlikely event of an underwater leak. The proposed insulating fluid is linear alkylbenzene, which provides optimal electrical, thermal, hydraulic and biodegradability characteristics. The fluid functions to control the high electric stresses in the insulation, which is important in this higher voltage (230 kV) application. The fluid's low viscosity aids in maintaining internal cable pressure requirements when the electrical load changes rapidly. It also evaporates relatively quickly from the water surface in the unlikely event of a leak. Alkylbenzene has a low order of fish, mammalian, and human toxicity and evaporates and biodegrades quickly.

Figure 1 – Submarine Transmission Cable



In waters deeper than -13.1 feet MLLW (-3 meters Canadian Chart Datum (CD)), cables are resting on the sea floor. These deeper water cables will be removed by pulling them onto a barge using a linear cable engine. In shallow waters, buried cables will be pulled from the sediments onto barges with winches or block-and-tackle.

BCTC will install three new 230 kV submarine cables. Cables will be laid directly on the seabed in waters deeper than -13.1 feet MLLW(-3 m CD) and buried to a depth of 3.3 feet

(1 meter) above -13.1 feet MLLW(-3 m CD). Burial of individual cables is required to provide protection from wave action and potential damage from boats and anchors, as well as for environmental reasons.

Landing a submarine cable is referred to as a "float-in". This process involves spooling cable off the primary cable-laying vessel, attaching floats and towing or winching the cable to shore. The primary cable-laying barge, which measures approximately 270 by 90 ft (82 by 27 m), will be anchored in water greater than 22.0 ft. deep based on MLLW (6 m CD) deep for the duration of landing operations. Cable float-in procedures pose risk to cable integrity, hence installers prefer to do this over as short a distance as possible. The installation of each cable system will take approximately one day.

## **2.5 Cathodic Protection**

No cathodic protection is planned for the portion of submarine cable in U.S. waters or the cables landing on the Canadian mainland at the English Bluff Terminal on the eastern shore of Georgia Strait. Cathodic protection systems will be installed at the cable landing sites on the western shore of Georgia Strait (Galiano Island) and at both cable landings (Parker Island and Salt Spring Island) on Trincomali Channel in Canadian waters. Those three cathodic protection systems are planned to be impressed current systems. These systems will have no effects in U.S. waters or on mainland shore facilities.

## **2.6 Maps**

A combined general area map and other maps showing the physical location (longitude and latitude) and ownership of the facilities on the international border are attached to this Application as Exhibit D.

## **2.7 Bulk Power System Information**

No bulk power system information is provided with this Application because there will be no bulk power supply facility within the U.S.

## **3. INFORMATION REGARDING POTENTIAL ENVIRONMENTAL IMPACTS**

### **3.1 Statement of the Environmental Impacts**

Project work within the U.S. is confined entirely to the Strait of Georgia; therefore, there are no flood plain or wetland impacts. The entire Project area within the U.S. is designated as a Wildlife Habitat Conservation Area and is subject to Whatcom County Critical Areas Ordinance. Please see the Whatcom County Critical Areas Habitat Assessment report prepared for the Project for details of conservation measures included as part of the proposed Project activities. A copy of such report is attached to this Application as Exhibit E.

For the effects determination for federally designated critical habitat, please see the Project Biological Assessment, a copy of which is attached to this Application as Exhibit F, and Section 3.4 below.

Work within the U.S. will take place in the Strait of Georgia, a navigable waterway.

Regarding Indian land impact, please see Section 3.2 below.

Regarding historic site impact, please see Section 3.2 below.

BCTC is not required to take any mitigation action in connection with National Environmental Protection Act or State Environmental Protection Act review. However, at the request of the Washington State Department of Fish and Wildlife, BCTC will undertake shoreline improvements at Lighthouse Park in Point Roberts, Washington, which work is

intended to mitigate temporary functional impacts to intertidal substrate habitats and consists of restoration of the beach and shoreline vegetation around the BC-Tel Building site. BCTC will also undertake construction of eelgrass beds to mitigate the temporary loss and disturbance of eelgrass during cable removal and cable installation.

### **3.2 Historic Places**

Tsawwassen First Nation ("TFN") documents the use of the west coast of Point Roberts as a primary canoe route. Ethnographic documentation of the TFN indicates the presence of a winter village located at English Bluff, British Columbia. For the BC provincial Environmental Assessment review process, BCTC conducted an Archaeological Impact Assessment for the transmission corridor including English Bluff. Recommendations for avoidance and monitoring were made for two sites at English Bluff and, as a condition of the BC Environmental Assessment Certificate awarded to BCTC, BCTC will comply with commitments made to avoid potential impacts to these sites by the Project, monitor Project work near these sites, and report any inadvertent discoveries. With adherence to these commitments and conditions, the Project will not adversely affect this resource.

Site 45WH207h is Boundary Marker #1 demarcating the international boundary between Canada and the U.S. The boundary marker, which was erected in 1861, is an obelisk 19 feet (5.8 meters) in height assembled from a number of smooth granite blocks mortared together on a rubble foundation. It is located on Point Roberts overlooking the Strait of Georgia a short distance from the beach. The proposed Project will not directly or indirectly impact this marker.

Site 45WH560 is documented with the Washington State Department of Archaeology and Historic Preservation as a Pre-Contact Shell Midden and is considered a traditional cultural

property to the Lummi Nation. The site boundaries of 45WH560 are documented to extend along the shore from the Point Roberts Lighthouse north to near the Gulf Road and Marine Drive intersection. The west coast of Point Roberts, which includes site 45WH560, is identified in the Lummi Language as Smo'qwech. The proposed Project will not directly impact this pre-contact shell midden site.

The Mary Island shipwreck is located approximately 1 mile (1.7 kilometers) south of the Project right-of-way. The Mary Island caught fire and sank on February 17, 1934, 8 miles (12.9 kilometers) west of Point Roberts (Millennia Research Limited 2005). The proposed Project will not directly impact this shipwreck site.

### **3.3 Minimum Rights-of-Way for Construction, Operation, and Maintenance of the Transmission Lines**

The Project will use existing rights-of-way in U.S. waters administered by Washington State. Except for an easement that BCTC will acquire from Gerald and Karen White concerning a small portion of Tideland Block No. 28 within the Department of Natural Resources corridor, the Project does not require the acquisition of new rights-of-way in the U.S. Except for some very minor adjustments, the Project does not require the acquisition of new rights-of-way in Canada. Minimum rights-of-way required in the marine environment for one circuit (consisting of three single-phase submarine cables) in shallow water locations will be approximately 125 feet (40 meters), to provide ten meters outside and between the cables. Right-of-way requirements in deep water are greater and are generally twice the water depth for each cable. This is required to permit retrieval, repair, and replacement of the cables from a repair vessel.

The Project will have no land-based facilities in the U.S. and will require no terrestrial rights-of-way in the U.S. Land-based facilities in Canada will be constructed within existing rights-of-way or on lands already owned by BC Hydro.

### 3.4 Threatened or Endangered Wildlife or Plant Life

There are no threatened or endangered plant species in or near the Project area.

Endangered wildlife species possible in the Project area include:

- chinook salmon (*Oncorhynchus tshawytscha*) – Puget Sound evolutionarily significant unit (ESU),
- bull trout (*Salvelinum confluentus*) – Coastal/Puget Sound distinct population segment (DPS),
- steelhead trout (*Oncorhynchus mykiss*) – Puget Sound DPS (proposed),
- killer whale (*Orcinum orca*) – southern resident population,
- humpback whale (*Megaptera noveangliae*),
- Steller sea lion (*Eumetopias jubtus*),
- leatherback sea turtle (*Dermochelys coriacea*),
- bald eagle (*Haliaeetus leucocephalus*), and
- marbled murrelet (*Brachyramphus marmoratus*).

Observations of three of the marine species—humpback whale, leatherback sea turtle, and Steller sea lion—have not been reported from the Project area or vicinity, and are thought to be present only rarely, if at all. The remaining listed species—Chinook salmon, bull trout, steelhead trout, southern resident killer whale, bald eagle, and marbled murrelet—are likely to be present in the Project area.



Of the federally listed species that occur in the Project area, Chinook salmon and killer whale are the only species with designated or proposed critical habitat in the Project area.

Please see the Project Biological Assessment, attached to this Application as Exhibit F, for more detail on effect analyses. Based on this Biological Assessment, the Project was determined to have no effect on species that rarely inhabit the defined Action Area (leatherback sea turtles). The Project may affect, but is not likely to adversely affect, Chinook salmon, bull trout, Southern Resident Killer Whales, Steller sea lions, humpback whales, bald eagles, marbled murrelets or essential fish habitat for Pacific salmon, groundfish, or coastal pelagic species. The Project will not jeopardize continued existence of stocks or population segments of steelhead trout, nor will the Project adversely modify proposed critical habitat for Southern Resident Killer Whales.

#### **4. DESCRIPTION OF ALTERNATIVES**

Prior to proposing the Project as the preferred method of meeting demand and capacity needs on Vancouver Island, BCTC turned to existing demand-side management programs to determine if forecasted needs could be met through various conservation programs such as BC Hydro's "Power Smart" and "Resource Smart" efficiency initiatives. BCTC determined that such programs could not meet forecasted shortfalls and, given the failure of recent proposals for on-island generation, transfer from the mainland was the most feasible and cost-effective solution.

As part of its engineering due diligence, and to meet the requirements of Canadian and U.S. environmental and electrical power regulations, BCTC evaluated technically and economically feasible alternatives to the Project and alternative means to carry out the Project.

Transmission alternatives considered included a number of alternate routes as well as various 500 kV AC and HVDC alternatives. The 230 kV AC alternative selected results in the least cost from both capital investment and operating costs perspectives. The alternative chosen also has the least environmental effect of the available transmission alternatives.

BCTC's analysis of the available alternatives was reviewed by two independent regulatory authorities in Canada, the BC Utilities Commission and the BC Environmental Assessment Office. Alternatives and environmental mitigation strategies for the portions of the Project in the marine environment within the Strait of Georgia near Point Roberts have been jointly examined by U.S. and Canadian fish and wildlife agencies.

For further discussion of the evaluation of each alternative considered, please see the Project Description Report and Route Options Analysis attached to this Application as Exhibit H.

## **5. FEDERAL, STATE AND LOCAL APPROVALS**

A summary of all anticipated federal, state and local approvals is provided in Exhibit G attached to this Application.

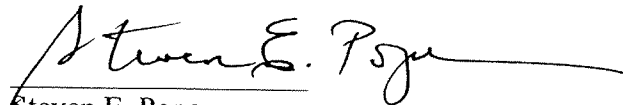
## **6. EXHIBITS**

The following exhibits are included:

Exhibit A	Presidential Permit PP-22, as amended to the date of this Application
Exhibit B	Opinion of Counsel
Exhibit C	U.S. Army Corps of Engineers Filing
Exhibit D	Project Area Maps
Exhibit E	Whatcom County Critical Areas Habitat Assessment Report
Exhibit F	Project Biological Assessment
Exhibit G	Federal, State and Local Approvals Chart
Exhibit H	Project Description Report and Route Options Analysis

WHEREFORE, BCTC respectfully requests that the DOE issue to BCTC an amendment to the Permit authorizing the construction, connection, operation, and maintenance of the facilities described herein for the transmission of electric energy at the international boundary between the U.S. and Canada.

Respectfully submitted,



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**APPENDICES AVAILABLE UPON REQUEST**