Lake Erie Connector

Project Description

January 2015

Submitted to:

National Energy Board
517 Tenth Avenue SW
Calgary, Alberta
T2R 0A8
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1.0 INTRODUCTION

1.1 Name and Nature of the Project

ITC Lake Erie Connector LLC (ITC Lake Erie) is proposing to construct and operate an International Power Line (IPL) greater than 50kV, called the Lake Erie Connector Project (Lake Erie Connector or the Project). The proposed Lake Erie Connector is an approximately 117 km 1,000 megawatt (MW) +/-320 kilovolt (kV) high-voltage direct current (HVDC) bi-directional electric transmission interconnection to transfer electricity between Canada (Haldimand County, Ontario) and the United States (Erie County, Pennsylvania) (Figure 1-1).

This merchant transmission line will be the first direct interconnection between the PJM Interconnection LLC (PJM) market in the U.S. mid-Atlantic and Midwest and the Independent Electricity System Operator (IESO) market in Ontario.

The Project has three distinct components: the HVDC converter stations and ancillary facilities, terrestrial cable systems, and underwater cable systems.

Table 1-1 provides a general overview of the location and scope of the Project components.

1.2 Scope and Timing of the Project

Table 1-1: Overview of Lake Erie Connector Components

<table>
<thead>
<tr>
<th>Components located in Canada</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HVDC Converter Station – Haldimand County, Ontario</td>
<td>7.5 ha</td>
</tr>
<tr>
<td>Terrestrial AC Cable Route – Haldimand County, Ontario</td>
<td>1.3 km</td>
</tr>
<tr>
<td>Terrestrial HVDC Cable Route – Haldimand County, Ontario</td>
<td>1.3 km</td>
</tr>
<tr>
<td>Underwater Cable Route (Preferred Route) – Canada</td>
<td>46.8 km</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components located in the U.S.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HVDC Converter Station – Erie County, Pennsylvania</td>
<td>7.5 ha</td>
</tr>
<tr>
<td>Terrestrial AC Cable Route – Erie County, Pennsylvania</td>
<td>0.7 km</td>
</tr>
<tr>
<td>Terrestrial HVDC Cable Route – Erie County, Pennsylvania</td>
<td>11.4 km</td>
</tr>
<tr>
<td>Underwater HVDC Cable Route (Preferred Route) – United States</td>
<td>57.0 km</td>
</tr>
</tbody>
</table>

Total length of HVDC Cable Route (Canada and U.S.)*: 116.5 km

*Not including AC cables
Proposed Underwater Cable Route

Haldimand Converter Station

Landfall
Haldimand County, Ontario (Canada)
Latitude: 42.797489
Longitude: -80.057042

Preferred Route

Canada / United States Border Crossing
Latitude: 42.420497
Longitude: -80.010767

Landfall
Erie, Pennsylvania (United States)
Latitude: 42.013194
Longitude: -80.403472

Proposed Terrestrial Cable Route

Terrestrial Cable Route

Legend

Isobath - 5 Metre Interval

Depth Metre

Data Sources: NOAA National Ocean Service (1999); Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

Figure 1-1: Proposed Project Route Map


Path: N:\GIS2\Projects\Lake_Erie_Power_Corporation\211948_SubseaCable_SM_Task1\Map_Docs\Draft\Report_Research\map_8.5X11P_20150120_Project_Location_Canada.mxd

No warranty is made for its accuracy and completeness.

Map information was compiled from the best available sources.

Proposed Underwater Cable Route

Preferred Route

Proposed Terrestrial Cable Route

Erie Converter Station

Erie, Pennsylvania (United States)
Latitude: 42.013194
Longitude: -80.403472

KM Post (10KM)

10
20
30
40
50
60
70
80
90
100
103.83

10
20
30
40
50
60
70
80
90
100
103.83
The Canadian HVDC converter station (Haldimand Converter Station) will be located in Ontario near a Point of Interconnection (POI) in Haldimand County, close to the Nanticoke transformer station (TS) switchyard in the Hamlet of Nanticoke. A 500kV Alternating Current (AC) transmission cable will connect from the Haldimand Converter Station to the POI. This station will convert 500 kV AC power to +/- 320 kV Direct Current (DC) power or vice-versa. The HVDC transmission line will consist of two transmission cables, one positively charged and the other negatively charged along with a fibre optic cable for communications between the converter stations. The HVDC transmission cables will run from the Haldimand Converter Station along an existing roadway to enter Lake Erie and cross from Canada to the United States.

In the U.S., the cable will make landfall in Springfield Township in Erie County, Pennsylvania and will run primarily along existing roadways to a new HVDC converter station (Erie Converter Station) to be constructed in Conneaut Township in Erie County, Pennsylvania. The Erie Converter Station will convert +/- 320 kV DC power to 345 kV AC power or vice-versa and connect to a nearby POI near the existing Penelec Erie West Substation and electric transmission line that is part of the PJM Interconnection grid.  

Project construction is anticipated to begin in late 2016 and will take approximately two years to complete, with an anticipated in-service date in late 2018. The Project has a minimum 30-year design life, but may operate longer. The HVDC transmission system will have the ability to transmit power from Canada to the U.S. or vice versa.

The Canadian portion of the Project, including the proposed Haldimand Converter Station facility, terrestrial cable system, and underwater cable system, are further described in Section 2, along with general information about installation methods for each component of the Canadian portion of the Project.

1.3 Regulatory Approach

ITC Lake Erie plans to file an application for an Election Certificate in the second quarter of 2015 to construct and operate the Project, pursuant to Section 58.23 of the National Energy Board Act (NEB Act).

ITC Lake Erie is proceeding with field studies, environmental and socio-economic assessments, engineering design, public and agency consultation, Aboriginal engagement, regulatory consultation and other activities needed to support the Project application, in accordance with the NEB Act and the NEB’s Electricity Filing Manual, July 2013 (Electricity Filing Manual).

Because this Project will proceed by way of an Election Certificate, the work and undertaking will be subject to the jurisdiction of the NEB and will not be subject to a provincial environmental assessment under the Environmental Assessment Act (Ontario). Nonetheless, ITC Lake Erie is participating in consultative processes with provincial and local agencies to enhance

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1 PJM Interconnection is the regional transmission organization that coordinates and directs the operation of the transmission grid and administers a competitive wholesale electricity market in all or parts of 13 U.S. states and the District of Columbia.
engagement and facilitate provincial and other stakeholder participation in the NEB’s review. A preliminary list of federal and Ontario regulatory permits and approvals that may be required for the Project is provided in Table 1-2

**Table 1-2: Preliminary List of Federal and Ontario Regulatory Permits and Approvals**

<table>
<thead>
<tr>
<th>Agency / Department</th>
<th>Authority</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment Canada</td>
<td>Species at Risk Act</td>
<td>A permit or agreement may be required if it is determined that the Project will have an incidental effect on a listed wildlife species, any part of such species critical habitat or the residences of such critical species.</td>
</tr>
<tr>
<td>National Energy Board</td>
<td>Section 58.23 of the NEB Act</td>
<td>Approval to install and operate an IPL</td>
</tr>
<tr>
<td></td>
<td>Fisheries Act</td>
<td>Under the memorandum of understanding (MOU) between the NEB and the Department of Fisheries and Oceans (DFO), the NEB will assess potential effects of the Project on fish or fish habitat and aquatic species at risk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the NEB determines that a project could result in serious harm to fish or fish habitat, or adverse effects on species at risk, the NEB will notify DFO that a Fisheries Act authorization and/or SARA permit may be required.</td>
</tr>
<tr>
<td>Ontario Ministry of Natural Resources</td>
<td>Public Lands Act</td>
<td>1. Easement 2. Work Permit</td>
</tr>
<tr>
<td>Ontario Ministry of Tourism, Culture and Sport</td>
<td>Ontario Heritage Act</td>
<td>1. Ontario Heritage Act Clearance 2. Built Heritage and Cultural Heritage Landscape Clearance</td>
</tr>
<tr>
<td>Ontario Ministry of Transportation</td>
<td>Highway Traffic Act</td>
<td>1. Heavy/oversize Load Transportation Permit</td>
</tr>
<tr>
<td>Haldimand County</td>
<td>Municipal Act</td>
<td>1. Easement 2. Site Plan Approval</td>
</tr>
<tr>
<td>Building Code</td>
<td></td>
<td>1. Building Permits 2. Electrical Permits</td>
</tr>
</tbody>
</table>
1.4 Purpose and Scope of the Project Description

This Project Description was prepared to support ITC Lake Erie’s Election Certificate application, in particular, to facilitate the NEB’s pre-application engagement and other activities. The Project Description is a preliminary description of the Project and the description will be further refined and modified, as appropriate, prior to filing of the NEB application. The Project Description describes the Project in accordance with the informational requirements prescribed by the NEB’s website, the Major Projects Management Offices’ (MPMO) website and the Electricity Filing Manual.

The Project Description is intended to:
1. Facilitate efficient regulatory review of the Project by the NEB
2. Facilitate determination of the scope of the Project and assessment required
3. Provide the Crown with sufficient information to consult with Aboriginal communities and/or groups that might potentially be affected by the Project
4. Provide the NEB with sufficient information to initiate pre-application engagement activities
5. Provide the NEB with sufficient information to initiate its Participant Funding Program (PFP)
6. Inform other regulatory authorities, landowners, stakeholders and Aboriginal communities and/or groups

1.5 Project Need and Benefits

The Project will address needs and offer a number of benefits, which include the following.

The Project will directly connect the IESO and PJM markets. PJM coordinates the movement of wholesale electricity in all or parts of 13 mid-Atlantic and Midwest U.S. states and the District of Columbia. This Project will be the first direct connection between the IESO and PJM markets.

The Lake Erie Connector will create a new energy transmission interconnection between the IESO and PJM markets, helping improve the security and reliability of the IESO and PJM energy grids. It will also enhance efficiency. Currently, power may be scheduled to flow around Lake Erie, but this is less efficient than a direct path. The Lake Erie Connector will provide a direct and controllable path for energy flow between the two markets.

The Project will capitalize on existing and projected energy market opportunities. Due to differences in resource mix and other market dynamics in the IESO and PJM markets, energy price differentials have been substantial, demonstrating significant market opportunities for the Project. Specifically, nuclear, hydro and other renewable and low-carbon emitting resources in Ontario, compared to a mix of relatively higher carbon emitting coal and natural gas resources in PJM coupled with state mandated renewable standards and federal environmental regulations, are expected to sustain the price differential.

As well, Ontario has excess supply and is actively exploring a capacity market and opportunities to export capacity. The Project offers opportunities to export energy and capacity from Ontario to PJM and address potential Ontario capacity requirements.
Other potential benefits of the Project will be addressed in the Election Certificate application.

1.6 Project Proponent

The Project will be constructed, owned and operated by ITC Lake Erie, an indirect subsidiary of ITC Holdings Corp. (ITC Holdings or ITC). ITC Holdings is a public company listed on the New York Stock Exchange.

ITC Holdings is the largest independent electricity transmission company in the U.S. Based in Novi, Michigan, ITC Holdings invests in the electric transmission grid to improve system reliability, expand access to markets, lower the overall cost of delivered energy and facilitate the connection of new generating resources to its transmission systems.

ITC operates high-voltage transmission systems in Michigan’s Lower Peninsula and portions of Iowa, Minnesota, Illinois, Missouri, Kansas and Oklahoma, serving a combined peak load in excess of 26,000 MW through its regulated operating subsidiaries, International Transmission Company d/b/a ITC Transmission, Michigan Electric Transmission Company, LLC, ITC Midwest LLC and ITC Great Plains, LLC.

ITC also focuses on new areas where significant transmission system improvements are needed through its wholly-owned subsidiary ITC Grid Development, LLC, which was established in 2006 to identify and develop new investment opportunities for the U.S. transmission grid. ITC Grid Development works in cooperation with ITC’s operating subsidiaries to plan, organize and facilitate research and analysis of emerging issues and opportunities. ITC Grid Development is supporting ITC Lake Erie in this Project.

1.7 Proponent Contact Information

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Fax: 248.946.3552
Email: ajamieson@itctransco.com
2.0 PROJECT INFORMATION AND ACTIVITIES

2.1 General Project Location and Description

The proposed Haldimand Converter Station site location and preferred HVDC and AC cable routes are shown in Figure 2-1. The Canadian on-land portion of the Project is located in Haldimand County, Ontario near the Hamlet of Nanticoke.

The Province of Ontario created Haldimand County on January 1, 2001 through the amalgamation of the former Towns of Dunnville and Haldimand and the eastern portion of the former City of Nanticoke. Significant natural features of the county include the Grand River and Lake Erie. The Grand River is a Canadian Heritage River, entering the County in the north and extending to Lake Erie in the eastern portion of the County. The Lake Erie shoreline within the County is 87 km in length and forms the southern landward boundary of Haldimand County. Both the Grand River and Lake Erie shorelines have some significant environmental attributes and also include areas of significant development including the Lake Erie Industrial Park (LEIP). The current landscape in the vicinity of the Haldimand Converter Station and the preferred terrestrial cable route is a mix of rural, agricultural, residential, commercial and light and heavy industrial land uses.

The proposed location for the Haldimand Converter Station and preferred terrestrial cable routes are within Haldimand County’s LEIP. Major occupants of the LEIP include the Ontario Power Generation (OPG) Nanticoke Generating Station (which recently ceased operation) to the east (which is the location of the POI to the IESO grid at the Nanticoke TS switchyard); the U.S. Steel Lake Erie Works to the west; and, the Esso Imperial Oil refinery to the northeast.

The Haldimand Converter Station site also falls within a Strategic Employment Area under the Haldimand Official Plan. This area consists of the Nanticoke Industrial Area and the associated Industrial Influence Area which are intended to accommodate land-intensive (i.e., large footprint) and land-intensive uses, including industrial, warehousing and logistic operations. These uses typically require large land holdings, access to Lake Erie, or are of a nature that is not appropriate for smaller urban areas in Haldimand County. The Strategic Employment Area contains the existing large heavy industrial operations noted previously, as well as other industrial uses and uses compatible with major industrial operations.

The proposed Haldimand Converter Station location is on lands currently zoned agricultural and under general agricultural use for field crops. Lands immediately to the west of the site are also zoned agricultural and are used for field crops and/or hay production. No major farm operations are located in the immediate vicinity of the site.

The Hamlet of Nanticoke is located to the northwest of the proposed Haldimand Converter Station site. The Hamlet of Nanticoke is recognized as a residential hamlet within the Industrial Influence Area of the LEIP. Minor residential infilling is permitted and the Hamlet may develop as a commercial service centre for the industrial and port facilities in the area.
Lake Erie Connector

Figure 2-1: Proposed Haldimand Converter Station Location

Legend
- Roads
- Railways
- Parcels
- Converter
- Station Property Boundary
- Transmission Line
- Pipeline
- AC Cable Route
- DC Cable Route

Contains information licensed under the Open Government Licence – Ontario
According to the 2011 census, Haldimand County had a population of 44,876. Approximately, 175 to 250 people reside within the Hamlet of Nanticoke and the nearby Hickory Beach Cottage area along the Lake Erie shore to the south of the site. The location for the Haldimand Converter Station was chosen in part to provide physical and visual separation from the Hamlet of Nanticoke and the Hickory Beach Cottage area.

Nanticoke Creek is located to the west of the proposed Haldimand Converter Station site. Nanticoke Creek is a warm water fishery with an associated Provincially Significant Wetland complex. A tributary of Nanticoke Creek crosses the northwest corner of the Haldimand Converter Station site. The proposed Haldimand Converter Station site location was also chosen in part to maximize the distance from Nanticoke Creek, thereby avoiding underground watercourse crossings.

The proposed Haldimand Converter Station location and layout is intended to:

- align itself with the industrial land-uses encouraged within the LEIP;
- minimize distance to the existing Nanticoke TS switchyard located north of the Nanticoke Generating Station;
- avoid unnecessary impacts to wetlands and other natural features located along Nanticoke Creek and the Lake Erie Shore;
- minimize natural resource and community impacts including impacts to the Hamlet of Nanticoke and Hickory Beach Cottages; and,
- maximize buffering of the facility.

2.2 Nature of Lands to be Crossed

The proposed location of the Haldimand Converter Station site is on privately owned property which is currently under active agricultural cultivation. The preferred AC cable route would leave the private property and travel along the right-of-way (ROW) for Haldimand Road 55 and through the OPG property on which the Nanticoke TS switchyard is located. The preferred underground HVDC cable route runs through this private property, south along the ROW for Haldimand Road 55 until entering under the shoreline of Lake Erie. The preferred cable routes and proposed Haldimand Converter Station site do not directly affect any natural features such as grasslands, woodlands, water bodies or wetlands.

Land use in the vicinity of the Haldimand Converter Station site and preferred cable routes is indicated in Figure 2-2.

The entire length of the underwater HVDC cable from the Haldimand County landfall to the Canadian/U.S. border will occupy provincial Crown lands as administered by the Ontario Ministry of Natural Resources (MNR).

The location of this Project falls outside the boundaries of the Haldimand Tract, which is a strip of land that runs the length of the Grand River and is significant to local Aboriginal communities. The Project site is approximately 21 km and 30 km from the two closest Aboriginal communities and groups which are the Mississaugas of the New Credit First Nation and Six Nations of the Grand River.
2.3 Converter Station Description

2.3.1 General Location and Description, Haldimand Converter Station

The total area of the private property that will need to be acquired for the proposed Haldimand Converter Station is approximately 15.5 hectares. The proposed layout for the Haldimand Converter Station is shown in Figure 2-3.

An area of approximately 2.5 hectares will be directly occupied by the Haldimand Converter Station and associated equipment. A total area of approximately 7.5 hectares will be impacted or disturbed including land required for permanent site access and surface water management, as well as lands that will be temporarily disturbed during construction for construction laydown and to support construction efforts.

The Haldimand Converter Station is proposed to have a main building (converter hall), which will be used to house HVDC converter modules and a service building to house control and protection equipment, cooling equipment and auxiliary distribution panels. The HVDC converter modules will convert the AC power to DC power or visa-versa. The main building (converter hall) will be approximately 110 m by 35 m with a building footprint of approximately 0.4 hectares and a height of approximately 15 m (Figure 2-3). The design of the HVDC converter modules will reduce audible sound and protect the equipment from exposure. The primary equipment installed outside of the building will likely include circuit breakers, disconnects, surge arrestors, transformers, cooling equipment, and power line carrier filters. The facility will also have an emergency generator. Security fencing will surround the Haldimand Converter Station area to prevent unauthorized access and to ensure public safety.

A driveway will be constructed to the Haldimand Converter Station from Haldimand Road 55. The driveway will be approximately 6.1 m wide, with a maximum 1 m shoulder. Site grading will ensure that stormwater flows can be conveyed without adverse impact to other properties.

The Haldimand Converter Station will interconnect through AC cables with the existing electrical power systems at the nearby Nanticoke TS switchyard POI (Figure 2-1). The preferred route for the 500 kV AC interconnection will run east from the proposed Haldimand Converter Station, across Haldimand Road 55, run along the east side of the Haldimand Road 55 ROW and across the Nanticoke Generation Station property. The length of the preferred AC cable route is approximately 1.3 km.
2.3.2 Construction Methods, Haldimand Converter Station

This section describes site preparation and general construction methods for the Haldimand Converter Station.

Erosion and sediment control devices will be installed; construction-phase stormwater management best practices will be implemented; and, grubbing and clearing of site will be undertaken. The Haldimand Converter Station site will likely be prepared for staging and laydown activities early in the construction process. An access roadway will be completed to facilitate equipment deliveries, construction worker movement and worker parking.

When site preparation is completed, the foundation and building construction works will commence. Site fencing will be installed to limit access to construction personnel. Following the construction work, the equipment installation activities will be initiated. The Haldimand Converter Station will contain buildings, structures, and electrical equipment to be installed on concrete slabs.

The AC interconnections with the Nanticoke TS switchyard are planned to be completed prior to commissioning and testing of the Haldimand Converter Station.

2.4 Terrestrial Cable Description

2.4.1 General Location and Description

The interconnection to the existing IESO grid will be by a 500 kV AC transmission line connecting the proposed Haldimand Convertor Station to the existing Nanticoke TS switchyard. The preferred route for the 500 kV AC cables will extend approximately 1.3 km, east from the proposed Haldimand Converter Station, across Haldimand Road 55, along the east ROW of Haldimand Road 55 and across the Nanticoke Generation Station property. The AC line will consist of three 500 kV XLPE insulated cables, the diameter of each cable is approximately 152.4 mm, and weighs approximately 38.7 kg/m. When installed underground, the cables will be placed at an approximate depth of 1 m to 2 m (see Figure 2-6).

The underground HVDC transmission line will consist of two cables and a fibre optic cable. The preferred underground HVDC transmission cable route will extend approximately 1.3 km from the proposed Haldimand Converter Station site in Haldimand County to the Lake Erie landfall point. The preferred HVDC cable route will follow the east ROW of Haldimand Road 55 from the proposed Converter Station site to the point of landfall at the Lake Erie shore. The underground HVDC transmission cables will be solid dielectric cables using cross-linked polyethylene (XLPE) insulation rated at +/- 320 kV. The diameter of each underground HVDC transmission cable is approximately 117mm and weighs approximately 30.1 kilograms/meter (kg/m) (see Figure 2-5).

Figure 2-4 shows the preferred cable routes. The preferred cable routes have been selected to minimize environmental and community impact.
CONCESSION 1 LOT 6
Area = approx. 2.5 ha (6 ac)

CONCESSION 1 LOT 5

CONCESSION 1 LOT 4

CONCESSION 1 LOT 7

Lake Erie Connector
Figure 2-4: Overland Project Routing

Legend
- Roads
- Railways
- 5 m Contours
- Stream
- Wetland
- Lots and Concessions
- Parcels
- Approx. Area of Impact / Construction Laydown
- Estimated Converter Station Footprint

AC Cable Route
DC Cable Route
(Lake Erie Connector (Cable Routes on East Side of Haldimand Road #55))

Date: 1/15/2015
FIGURE 2-5: TYPICAL AC (TOP) AND HVDC (BOTTOM) TRANSMISSION CABLE CROSS SECTIONS

NOTE:
1. ALL DIMENSIONS ARE PRELIMINARY, TO BE CONFIRMED DURING DETAILED DESIGN.

SEGMENTAL COPPER CONDUCTOR SEMI-CONDUCTING CONDUCTOR SCREEN
CROSS-LINKED POLYETHYLENE (XLPE) INSULATION SEMI-CONDUCTING INSULATION SCREEN
SEMICONDUCTING SWELLING TAPE METALLIC SHEATH/CONCENTRIC NEUTRAL
POLYETHYLENE JACKET

APPROX DIA: 152.4 MM (6 INCHES)
APPROX WEIGHT: 38.7 KG/M (28 LBS/FT)

500KV NANTICOKE INTERCONNECTION
SCALE NTS

APPROX DIA: 117MM (4.6 INCHES)
APPROX WEIGHT: 30.1 KG/M (20.2 LBS/FT)

± 320KV DC 2500 SQ MM LAND CABLE
SCALE NTS
DIRECT BURIED CABLES
±320kV DC LAND CABLES
(NOT UNDER PAVEMENT)
SCALE: NTS

NOTES:

1. ALL DIMENSIONS ARE PRELIMINARY, TO BE CONFIRMED DURING DETAILED DESIGN.

2. CONTRACTOR SHALL INSTALL WARNING MARKING TAPE ABOVE THE DUCT BANK, 12 TO 18 INCHES BELOW GRADE.

3. BACKFILL FOR DUCT BANK SHALL BE THERMALLY ACCEPTABLE, FLOWABLE THERMAL BACKFILL (FTB). SELECTED GRANULAR FILL AND NATIVE SOIL ARE POSSIBLE BACKFILL MATERIALS. ALL BACKFILL MATERIALS SHALL BE APPROVED BEFORE INSTALLATION. ALL BACKFILL SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS.

4. DIRECT BURIED CABLES SHALL BE ENCASED IN CLEAN THERMAL SAND. ALL BACKFILL MATERIALS SHALL BE APPROVED BEFORE INSTALLATION. ALL BACKFILL SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS.
As noted, the majority of the terrestrial transmission system will be installed within the ROW of Haldimand Road 55. Construction activities, including traffic management will be coordinated with the Haldimand County Roads Department and adjacent property owners as appropriate to minimize disruption during installation.

2.4.2 Construction Methods

Proposed construction methods and erosion and sediment control plans are summarized in the following sections.

2.4.2.1 Construction Access and Temporary Workspace

The temporary construction work areas for cable installation will be primarily in the road ROWs. A typical temporary construction area in the roadway ROW will be approximately 7 m to 12 m. Transportation of construction equipment and materials will be coordinated with Haldimand County and local transportation and law enforcement authorities as required. Construction lay-down areas on the Haldimand Converter Station site may also be used to support the cable installation process.

Excavated soils will be temporarily stockpiled within the worksite or transported to an off-site location if onsite storage is not possible, with topsoil stored separately from excavated subsoil. There are no wetland or stream crossings associated with the preferred cable routes for either the AC or HVDC cables.

Prior to construction, best management practices (BMPs) for erosion and sedimentation control will be undertaken along wetland boundaries to prevent the escape of sediment from work and stockpile areas.

2.4.2.2 Cable Installation

Excavation equipment will be used to dig the trench (e.g., excavators, backhoes, loaders, etc.). The cable will be laid directly into the bottom of the excavated trench. Due to weight restrictions for over-road hauling of cable reels, the terrestrial cable will be delivered and installed in lengths of roughly 762 m. Cables will be jointed together in joint pits, which will be approximately 2.4 m wide by 10 m long by 1.8 m deep. The joint pits will be backfilled after cable-jointing operations are complete.

The entire length of trench necessary to accommodate a reel of cable will be excavated prior to cable system installation. After excavation, the trench will then be prepared with low thermal resistivity “bedding” material as necessary and each cable will be placed in the trench. The trench backfill operation will immediately follow the cable installation, and restoration will be completed within a few days. The standard construction sequence is summarized as follows:

- Initial clearing operations (as necessary) and install stormwater and erosion control measures.
- Excavate 762 m trench segment.
• Prepare trench, add bedding material, and install temporary rollers to pull cable along trench.
• Install cable along with fibre optic cable.
• Install physical protection layer (concrete slab, polymer barrier or similar protection).
• Set up work boxes and perform splicing.
• Install metallic tracer tape.
• Backfill and compact cable trench.
• Restore construction area to original conditions and install above grade markers where the overland HVDC transmission cables are buried outside of public ROWs.

2.4.2.3 Wetland and Stream Construction Methods

The preferred route for the HVDC and AC cables does not cross any wetlands or streams. A separation distance of over 20 m will be maintained between the cable routes and any wetland or watercourse features on the Haldimand Converter Station site.

2.4.2.4 Trenchless Construction Methods

Trenchless construction methods will be utilized in locations where open trenching is inappropriate due to either physical constraints (roadway crossings), or where the transmission system transitions from underwater to underground segments. Two types of trenchless installation will be used in construction of the Project: Jack & Bore and Horizontal Directional Drilling (HDD). The equipment used and type of operation will vary depending on the length and depth of the installation.

Jack & Bore Construction Method

Jack & Bore will likely be used for crossings less than 91 m with uniform, cohesive soils. Closed face casing installation methods such as micro-tunneling may be required in certain areas with high water tables and non-cohesive soils to prevent running soil conditions.

Jack & Bore installations begin by excavating a launching and receiving pit on either side of an obstacle (e.g., a road). The launching pit is typically 3 m to 4.5 m wide and 9 m to 12 m long. The receiving pit is the same width, but approximately half the length. Once the excavations are complete, a hydraulic ram is used to push a steel casing through soil while removing soil inside the casing with an auger. A cutting head on the casing opens the hole; the auger is not advanced ahead of the casing or used for boring.

Depending on installation conditions, the steel casing will either be left in place or pushed out by a replacement casing of reinforced concrete pipe or other material. Once the permanent casing is in place, PVC conduits are installed into the casing on rolling spacers. The annular space between the conduits and the casing is filled using a thermally acceptable free-flowing grout before tying the casing installation into the open cut sections.
**Horizontal Directional Drilling (HDD) Construction Method**

HDD construction is used for longer crossings where open trenching is inappropriate. This method avoids excavating a trench and is commonly used for crossing lakes, wetlands, rivers, roads and railways. HDD will be used for the transition point between land and Lake Erie to avoid and/or minimize disturbance to the Lake Erie shoreline and near shore areas.

HDD uses a guided drill rig to open a pilot bore. Then multiple reaming passes of the pilot bore are done to open the hole to the diameter required to install the pipe bundle into the borehole, typically 50 percent larger than the pipe bundle. Drilling fluid, a combination of water and bentonite clay, is used to stabilize the sides of the borehole and carry the cuttings out of the borehole. Bentonite clay is a naturally occurring mineral that is non-toxic.

Once the borehole is open and stable a bundle of fused or welded pipe is pulled into the borehole. For this Project, the pipe will be high density polyethylene (HDPE) heat fused into a single length before being pulled into the borehole.

The equipment used in an HDD operation includes an HDD drilling rig system, a drilling fluid collection and recirculation system, and associated support equipment. For each HDD location, three separate drill holes will be required, one for each cable, including the fibre-optic cable. Each cable will be installed within a 25-cm to 30-cm diameter HDPE pipe for underground installation and 36-cm to 46-cm diameter pipe for the cables in the lake. Spacing between the borehole paths will be required to minimize interference.

The HDD operation will occur in a temporarily cleared work area of approximately 23 m by 46 m. Setup for the HDD boring will be located a minimum of 15 m from stream and wetland areas. Boring equipment setups will not be staged in wetlands. Small (1.8 m x 1.8 m x 1.2 m) sump pits may be excavated at the drill entry and exit points to collect drilling fluid and associated drill spoil to be pumped into tank trucks.

All drilling fluid solids (bentonite clay) and cuttings will be contained and settled in tanks or sediment traps, which will be disposed of at an approved facility. Water used in the drilling fluid will be recovered and reused during HDD operations after filtering out cuttings. Once HDD is complete, the water used in the drilling fluid will be disposed of with the solids at an approved facility. Excavated soils will be temporarily stored on site during construction and will be used to restore the site to its previous grade once the drilling process has been completed; or transported for disposal/reuse at an approved location. The disturbed areas will be restored to their original grade and seeded with annual rye-grass to allow for natural revegetation.

There are two commonly used methods for HDD installations under shorelines.

The first and most common method is to locate the drill rig on land and end the pilot bore short of punching out into the water. A soil plug is left in place to contain the drilling fluid while the hole is opened, using forward reaming tools. Once the borehole is complete, circulation of fluids in the borehole would be ceased, and then the drill head is pushed out through the soil plug, this results in some drilling fluid being released into controlled containment. Depending on
conditions, it is expected that curtains or a pre-excavated drilling pit will be deployed to contain the release prior to punching out.

While the borehole is being completed the pipe is assembled on land into a ‘pipe string’ and floated out onto the lake. It is then pulled into the borehole from the water to the land side terminus of the HDD bore.

The second method for HDD installation under a shoreline is to locate the drill rig in the water on an elevated platform. A coffer dam is installed around the drill entry point to contain drilling fluid and the borehole is drilled from the water onto shore. The pipe string is then assembled on land and pulled into the borehole from the land side terminus of the HDD bore to the water.

The method used for this installation will depend on topography and geotechnical investigation. If the soils are too hard for forward reaming tools, a method that allows access from both sides and/or modified equipment may be required.

HDD has the potential for “inadvertent returns”, which occurs when drilling fluids (i.e., bentonite clay) leak through an unidentified weakness or fissure in the soil. This can cause drilling fluid to become suspended or dispersed in the lake or on the land surface. A written Inadvertent Return Plan will be developed for each location, describing how to identify, contain, and remediate releases of drilling fluid. Descriptions of drilling fluid (e.g., material safety data sheets) will also be included in the plan. The monitoring program will consist of visual observations in the surface water at the targeted drill exit point and monitoring of the drilling fluid volume and pressure within the borehole. Visual observations of drilling fluid on the surface or in nearby water, or excessive loss of volume or pressure in the borehole will trigger appropriate response actions by the HDD operator, including halting drilling activities and initiating cleanup of released bentonite clay.

2.5 Underwater Cable Description

2.5.1 General Facility Location and Description, Underwater Cable

The preferred underwater cable route for the +/-320 kV HVDC transmission line will extend approximately 46.8 km across Lake Erie from the Canadian landfall location to the U.S./Canada border (see Figure 1-1). As described above, the HVDC transmission cables will transition from the landfall location into Lake Erie via HDD installation. The underwater transmission cables will be sited to maximize operational reliability and minimize cost and potential environmental impact from construction, operation, and maintenance.

The underwater HVDC transmission cables will be solid dielectric XLPE insulated HVDC cables (Figure 2-5), which will be deployed with a fibre optic cable. An extruded lead moisture barrier with a polyethylene jacket will be used to protect the insulation system. To protect the cable and provide additional strength during installation, an armoring system consisting of one layer of galvanized wires with bedding layers will be installed over the polyethylene jacket. Each cable will be approximately 152 mm in diameter and weigh approximately 62.4 kg/m. The two underwater HVDC transmission cables and the fibre optic cable will be bundled together during installation to minimize disturbance and external electrical and magnetic fields.
In most areas the cables will be buried beneath the lakebed to protect the cables from damage due to shipping traffic, fishing activity and ice scour. The burial depth will be determined during detailed design. Typical burial depths will range from 1 m to 3 m. In areas where sufficient depth cannot be reached due to soil conditions or other facilities (e.g., pipelines), additional protection such as articulated concrete mattresses or reinforced concrete barriers may be required. Articulated concrete mattresses are typically made of small pre-formed 22.7 cm to 30 cm square concrete blocks that are interconnected by cables or synthetic ropes in a two-dimensional grid and they typically range in size from 2.4 m x 6.1 m to 2.4 m x 12.1 m.

The preferred HVDC transmission cable route is expected to encounter several pipeline crossings in Canadian waters associated with natural gas extraction activities. For these crossings, a protective layer will be placed over the existing utility, the new cables will be placed over this first layer of protection, and a second layer of protection will be installed over the cables. Alternatively, it may be more feasible to temporarily remove the existing pipelines, bury the HVDC cable, and then re-install the pipelines.

A small number of joints will be required in the underwater HVDC transmission cable system. Cable joints for the underwater HVDC transmission cables are slightly larger than the cables. Joints typically cannot be entirely buried and will also require protection in the form of articulated concrete mattresses or other means.

2.5.2 Construction Methods, Underwater Cable

Installation engineering and marine route surveys are being performed to evaluate the preferred route location (in order to avoid shipwrecks, existing utilities (pipelines) to the extent possible) and to refine construction methods. The general sequence for installing the underwater HVDC transmission cables will be as follows:

- HDD conduit
- Pre-lay grapnel run
- Cable installation
  - Bedrock trenching
  - Cable laying and protection
- Remedial protection measures as necessary

**HDD conduit** — Starting at the shore landing, three HDD conduits will be installed extending approximately 750 m into the lake from the shoreline (see Section 2.4.2.4 for a description of the HDD construction method). At the land-side terminus of the HDD bore, a pit will be excavated to contain any drilling fluids for later pumping out and disposal, and to act as a start point for the cable burial.

**Grapnel run** — The purpose of a grapnel run is to locate any immovable obstructions, such as large boulders, and to remove any smaller obstructions such as fishing gear, rocks or wood. During this process a grapnel chain is towed along the bottom by a self-propelled barge. The grapnel will penetrate the lake bottom to a maximum depth of 0.3 m, depending on sediment type. If an obstacle is encountered, the barge will stop, drop anchor, and send a diver to the
bottom; the obstacle may then be winched to the surface for disposal. Debris will be disposed of at an upland facility. If an object is too large, or not movable, the location will be recorded and the route modified to avoid the obstacle during the cable installation.

*Cable installation* — At the Nanticoke landfall, bedrock is either exposed or very close to the surface for a substantial distance out to deeper water (i.e., over 1.6 km). In this near shore area, depending on the final geology, a trench may be excavated in the bedrock (primarily limestone) from the exit of the HDD bore to softer lake bed material where jet plow burial can be utilized. This trench will be approximately 1 m deep and about 1 m wide. It is expected that a barge-mounted drill will drill 1.2 m diameter holes to a depth of 1.8 m on 1.5 to 1.8 m centers. The spacing between holes will be removed by divers and a barge-mounted excavator with hammer attachment. The trench will be bedded with clean stone (e.g., #57) for cable installation and backfilled with additional clean stone. Some low intensity blasting may be required for harder bedrock material. Drilled and excavated material will be side cast spread on the lake bottom.

The second phase will be installation of the transmission cables by the use of a towed jet plow. This very common technique for burying underwater cables and uses the combination of a plow shear and high pressure water jets to cut a trench in the lakebed (see *Figures 2-7* and *2-8*). The installation process will be conducted using a dynamically positioned cable ship and towed plow device that simultaneously lays and embeds the underwater transmission cables in a trench. A dynamically positioned cable ship or barge will use thrusters as a propulsion system to tow the plow without the use of anchors.

*Remedial protection measures* — The third phase of the cable system installation process will be any necessary cable protection activities. The near shore bedrock trench will be allowed to backfill naturally with sediment. In limited areas along the underwater route, the necessary burial depths for the protection of the transmission cables might not be achievable due to geology (e.g., areas of bedrock) or existing submerged infrastructure (e.g., other electric cables, natural gas pipelines). In these instances, where the cables must be laid on the lake bottom, they may be covered with protection including (but not limited to) sloping stone rip-rap or articulated concrete mattresses.

Cable laying is a continuous procedure. The majority of material required for the cable installation will be transported and stored on the installation vessel; although, it cannot carry enough cable to complete the entire route. A cable transport barge will therefore be used to carry the rest of the cable. In the unlikely event the cable installation must be abandoned due to extreme weather conditions, the cable will either be surface-laid along the route, or in extreme cases, the cable would be cut so that the installation vessel can depart to a safe location. Following return of appropriate weather conditions, the cable will then be retrieved, jointed as necessary, and the installation process will continue.
FIGURE 2-7:
PHOTOGRAPH OF A TYPICAL JET PLOW

FIGURE 2-8:
DIAGRAM OF TYPICAL JET PLOW
2.6 Transmission System Operating and Design Features

The following sections outline general information about proposed system operation, some of the protective measures included in the cable system design and information regarding repair measures that will be undertaken if a cable system sustains damage.

2.6.1 System Operation

The Project will be operated in compliance with applicable North American Electric Reliability Corporation (NERC) reliability standards and IESO and PJM reliability and operability standards and criteria. In the U.S., the Project will be placed under the functional control of PJM. Coordination between the IESO and PJM will determine the direction and quantity of electricity flow through the Project. Because the Project is a HVDC facility, the ITC operators can control energy flow over the Project, matching operational and commercial decisions while eliminating the possibility of unintended power flows.

2.6.2 Electromagnetic Compatibility Limit

The Haldimand Converter Station will be designed in accordance with the applicable standards for Electromagnetic Compatibility Limits and will not exceed the design criterion for interference levels.

2.6.3 Relay Protection

Both the AC and HVDC cable systems will be protected by high-speed protection systems at the two converter stations. Protection of the AC interconnection facilities will be designed in accordance with the requirements of the interconnected utilities.

2.6.4 Damage Repair

While unlikely, it is possible that the transmission cables could be damaged, either by human activity or natural processes. Before operation of the Project, an Emergency Repair and Response Plan (ERRP) will be prepared to identify procedures and contractors necessary to perform maintenance and emergency repairs. The typical procedure for repair of a failure within the underwater and underground portions of the Project route is described as follows:

- **Underwater Transmission Cable Repair** — In the event a marine cable repair is required, the location of the problem will be identified and crews of qualified repair personnel will be dispatched to the work location. A portion of the transmission cable will be raised to the surface, the damaged portion of the cable cut, and a new cable section will be jointed in place by specialized jointing personnel. Once repairs are completed, the transmission cable will be reburied using a water jetting device or covered with concrete mattresses. This repair will result in an additional length of cable that would be placed on the seabed, with the excess cable looping to the side of the cable route.
• **Underground Transmission Cable Repair** — In the event an underground transmission cable repair is required, the location of the problem will be identified and excavated, qualified personnel will remove the damaged portion of the cables, and a new cable section will be jointed in. Once repairs are completed, the transmission cable and joints will be reburied.

The time required to repair a damaged cable will vary due to such factors as the nature and the amount of damage, location on land or in the lake, and weather conditions and other variables. If the damage occurs when the lake is frozen, an icebreaker may be necessary to move some of the ice, or alternately, it may be necessary to wait for the ice to melt.

### 2.7 Project Schedule

The Project includes the following phases:

- Consultation, Approvals and Permitting
- Cable Manufacture and Installation
- Converter Station Manufacture and Installation
- Commissioning
- Operation and Maintenance
- Decommissioning, abandonment and site reclamation.

The preliminary Project schedule is shown in Figure 2-9. It is anticipated that the NEB Election Certificate application will be submitted in the 2\(^{nd}\) quarter of 2015 and NEB approval and key environmental approvals will be received by the 3\(^{rd}\) quarter of 2016. Construction will be initiated in the 4\(^{th}\) quarter of 2016, with commissioning and commercial operation targeted for the 4\(^{th}\) quarter of 2018.

The Project has a minimum 30-year design life, but may operate longer.
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<th>Start</th>
<th>Finish</th>
<th>Planned Duration</th>
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**EF3 - Commissioning**

**Trial Run Operation**

**Figure 2-9: High-Level Preliminary Project Schedule**
3.0 Land

This section describes the land requirements for the Project and the process for acquiring the necessary lands.

The land requirements include:

- Permanent private land tenure for the construction and operation of the proposed Haldimand Converter Station. These lands are currently under option to purchase and may be acquired by exercising the option.
- Permanent tenure on lands required for the terrestrial HVDC and AC cable alignment, through permanent easement on lands under municipal ownership (Haldimand County, Haldimand Road 55 ROW).
- Permanent tenure on lands required for the underwater HVDC cable alignment, through permanent easement in accordance with the MNR land disposition process.

Table 3-1 summarizes the land ownership associated with the Haldimand Converter Station site and along the Canadian portion of the HVDC and AC Cable routes.

<table>
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<tr>
<th>Land Type</th>
<th>Approximate Percentage of Land Crossed</th>
<th>Approximate Area or Length</th>
<th>Entity Responsible for Administration</th>
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<td>Private (Freehold)</td>
<td>100% of Converter Station</td>
<td>7.5 ha occupied (15.5 ha to be acquired)</td>
<td>Private Land Holding</td>
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<td>0.3% of the cable route</td>
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<td>OPG–owned lands</td>
<td>0.5% of the cable route</td>
<td>0.31 km</td>
<td>Hydro One will own and administer the cable and infrastructure on OPG lands</td>
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<td>Provincial (Crown)</td>
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<td>Ministry of Natural Resources</td>
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<td>1.8% of the cable route</td>
<td>1.14 km</td>
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</table>
3.1 Consultation with Landowners and Occupants

There are no other private landowners or occupants of lands along the preferred cable route in Canada, with the exception of a single private landowner of the proposed site for the Haldimand Converter Station, ITC Lake Erie has secured an option to purchase the property for the Haldimand Converter Station, and continues to engage in discussions with the landowner.

The Project team has engaged in consultation with the MNR regarding the Crown land disposition process. The Project team will continue this engagement in support of the land disposition process which will proceed concurrently with the NEB Election Certificate process.

There is one existing leaseholder along the preferred cable route, Dundee Energy Ltd. (“Dundee”). Dundee owns and operates underwater natural gas pipelines. The Project team has engaged with Dundee regarding the underwater HVDC cable installation and is proceeding to negotiate a crossing agreement with Dundee.

ITC Lake Erie has also engaged with Haldimand County regarding an easement within the ROW of Haldimand Road 55. Haldimand County has been supportive of the cable alignment along the east side of the road ROW.

3.2 Land Use

As noted previously, the proposed Haldimand Converter Station site is privately owned, is designated for agricultural land use, and is currently under active agricultural cultivation. The preferred underground HVDC cable will travel through this private property, along the ROW for Haldimand Road 55 until entering under the shoreline of Lake Erie. The AC cable will leave the private property, travel along the ROW of Haldimand Road 55, and through the OPG property on which the Nanticoke TS switchyard is located. The preferred cable route and proposed Haldimand Converter Station site do not directly affect any natural features such as grasslands, woodlands, water bodies or wetlands.

Land use in the vicinity of the Haldimand Converter Station site and cable routes is indicated in Figure 2-2.

The entire length of the underwater HVDC cable from landfall to the Canadian/U.S. border will occupy provincial Crown lands as administered by MNR.

3.2.1 Aboriginal Communities

The Project does not cross any First Nations reserves, as defined under the Indian Act. There are Aboriginal groups who assert rights and interests within the vicinity of the Project. A list of Aboriginal communities and groups identified by ITC Lake Erie as having potential interest in the Project, and the status of engagement with these groups, is provided in Section 5.

The location of this Project falls outside the boundaries of the Haldimand Tract, which is a strip of land that runs the length of the Grand River and which is significant to local Aboriginal
communities. It is approximately 10 km wide on either side of the river. It was granted to the Six Nations Confederacy in recognition of their loyalty to the British Crown during the American Revolution. The Haldimand Tract is central to the ongoing land claims of the Six Nations with the surrounding settler communities, provincial and federal governments. The Project site is approximately 21 km and 30 km from the two closest Aboriginal communities which are respectively the Mississaugas of the New Credit First Nation and Six Nations of the Grand River.
4.0  PUBLIC AND AGENCY CONSULTATION

A Consultation Plan has been developed and is being implemented for the Project in accordance with the NEB Electricity Filing Manual.

Communications are a means of raising awareness, understanding and acceptance of the need, importance and overall benefits of the Project, while engaging audiences to actively comment and participate in various phases of the process. Effective communications are necessary to build trust and confidence in the Project and to ensure successful development, construction and operation of the proposed Project.

Effective engagement with the appropriate audience is essential for the successful completion of the NEB application. Engagement with potentially affected stakeholders, Aboriginal groups, interested parties, communities and government agencies has been initiated early in the process to identify and avoid issues or concerns wherever feasible.

The effectiveness of the Public and Agency consultation program will be tested repeatedly throughout this Project by using a number of indicators including:

- Attendance at public open houses and other events;
- Number of people spoken to at public events, and completion of comment sheets at these events;
- Media coverage – accurate message delivery and uptake;
- The quantity and nature of the comments received through Project feedback;
- Pre and post public opinion following major communications initiatives as appropriate.

4.1  Agency Engagement

The Project team has engaged in discussions with local, provincial and federal officials and will continue this engagement throughout the Project, with varying degrees of engagement depending on the phase of the Project. Engagement of local municipal and other officials has focused on engagement of officials whose districts and municipal entities will be predominantly affected by the Project, such as officials with Haldimand County. Engagement of federal and provincial officials has focused on engagement of key agencies responsible for environmental and energy policy and review. Consultation has expanded to include agencies with responsibility for or interest in the key technical studies that will be undertaken in support of the NEB application.

Agency consultation was initiated through the development of an agency contact and mailing list, and the distribution of Project notices and correspondence.

To date, Canadian federal, provincial and local agencies have been engaged through correspondence, meetings and/or teleconferences, including:

**Provincial and Local Agencies**

- Ministry of Aboriginal Affairs
- Ministry of Energy
Agency engagement will continue through the completion of the planning phase for the Project.

4.2 Public Engagement

Early development of a stakeholder/audience database and identification of target audiences has allowed for tailoring and/or focusing of key communications elements in order to best reach the target audience. Every person/landowner within the study area (route) is a part of at least one of the target audiences from which input will be sought. To ensure that the consultation program is well grounded and effective, the Project team has conducted a review of potentially relevant stakeholders and developed a comprehensive list of key stakeholders (property owners, occupants) for the area immediately around the Haldimand Converter Station and surrounding community including those located within 100 m of the preferred cable routes.

Public Information Centres (Open Houses) are central to communications at key points in the process. At these sessions information is presented in panels and handouts, with an opportunity for individual discussion with the Project team members. Open Houses have been and will continue to be held in the area closest to the proposed Haldimand Converter Station and preferred cable routes (i.e., Nanticoke), to solicit input from the general public and broader audience and, as well, from the public and other stakeholders located in proximity to the Project. Information from each session has, and will continue to be made available on the Project website. Stakeholders and members of the public identified in the Project contact list, local municipal councilors, local organizations and groups, landowners and occupants in the vicinity of the Project, are invited to these sessions.

The Public Consultation process carried out to date has included the following activities:
- Development of the stakeholder and public contact and mailing list as noted above;
- Development of Project FAQs, posted online and provided at project Open Houses;
• Development of a Communications Tracking database, to track the receipt of comments through various media (phone, email, in person) and the responses provided to these comments;
• Continued engagement with local, provincial and federal agencies through meetings, emails and telephone calls;
• Notification of public Open House #1 and #2 through Canada Post targeted mailing;
• Advertisements in newspapers including news releases and the Notices for the public Open Houses and,
• Public Open House #1 held on December 10, 2013; and
• Public Open House #2 held on July 29, 2014.

To date, feedback received from residents has generally been positive. No major objections have been raised.

Consultation with the Public and Agencies will continue in accordance with the Consultation Plan, including another round of dialogue with Agencies and the Public in regards to the outcome of the technical studies completed in support of the Project, prior to submission of the Election Certificate.
5.0 ABORIGINAL ENGAGEMENT PROGRAM

5.1 Program Overview

The Aboriginal engagement program is a key component of the Consultation Plan for the Project. ITC Lake Erie recognizes that Canada’s First Nations and Métis have a distinct history and relationship with the Crown that is enshrined in section 35 of the Constitution Act, 1982 and that continues to evolve as Canada seeks to reconcile the pre-existence of Aboriginal societies with the sovereignty of the Crown.

ITC Lake Erie is committed to creating a meaningful Aboriginal engagement program and recognizes that one or more Aboriginal groups may have rights that can impact the Project. For this reason, the Project team has created an adaptive engagement program. As information is disseminated about the Project and interests and concerns are raised, the Aboriginal engagement program will evolve to ensure mitigation and management of potential effects on the exercise of existing or asserted Aboriginal or Treaty rights and interests, where necessary or advisable.

The Aboriginal engagement program is guided by legal requirements derived from Section 35 of the Constitution Act, 1982, applicable regulatory requirements and relevant guidance sources, such as the NEB Electricity Filing Manual, the Canadian Environmental Assessment Act, 2012, and related policy and guidance materials.

Project engagement to date has focused on:
- understanding rights and interests of the Aboriginal groups in the vicinity of the Project
- carrying out Project introduction meetings to introduce ITC Lake Erie and provide general information about the Project
- establishing a relationship with those First Nations, Métis groups and Chiefs Councils that have demonstrated an interest to learn more about the Project
- entering into agreements to ensure participation for archaeological monitoring by Mississaugas of New Credit and Six Nations of Grand River
- entering into an engagement agreement with Mississaugas of New Credit and negotiating an MOU to guide engagement and future consultation activities
- entering into an engagement agreement with Haudenosaunee Confederacy Chiefs Council
- entering into an engagement agreement with Six Nations of the Grand River
- planning and arranging Community Meetings and Open Houses for upcoming technical material review
- continuing outreach and meeting with interested Aboriginal groups

The Project team will continue to engage in discussions with Aboriginal groups and their respective communities throughout the Project, with varying degrees of engagement depending on the interests of potentially impacted Aboriginal groups and their respective consultation protocol requirements.
5.2 Principals, Goals and Objectives

5.2.1 Focus of Aboriginal Engagement and Consultation

As part of the engagement and consultation processes, certain Aboriginal groups may take an interest in all or any of the following in respect of the Project:

- nature of Project activities and rationale
- existing and proposed use of Project site, tenure of land and water access areas
- environmental impacts and technical studies
- electricity connection points and rationale
- facilities to be constructed and design
- federal, provincial and local permits and approvals
- impacts to Aboriginal and Treaty rights during construction and operation of the Project
- archaeology protocols, processes and local oversight and involvement
- employment and subcontracting opportunities as well as other economic development participation or partnerships
- collection and protection of traditional ecological knowledge in the vicinity of the Project
- ongoing monitoring in respect of the Project

During the course of the Project, it is anticipated that comments, issues and concerns may arise as an outcome of the communications and engagement activities in respect of each phase of the Project. A transparent record of communications will be developed to ensure an appropriate response is developed for issues as they arise.

Once studies are completed in support of the NEB application, Aboriginal groups will be provided with additional opportunities to provide comments on the methodology, outcome of the technical studies and proposed mitigation.

5.3 Identification of Aboriginal Groups

5.3.1 Preliminary list of Aboriginal Groups

In August 2013, the Project team carried out a preliminary historical desktop analysis of First Nations and Métis groups with existing or asserted Treaty rights or claims in the vicinity of the Project. The initial list was based on proximity of Project area to:

- Reserves under the Indian Act
- Treaty surrenders and land transfers
- Areas identified by Aboriginal communities as their traditional land use areas
- Areas under land claim negotiations
- Areas under existing or asserted claims for Aboriginal title
- Métis settlements and communities
The purpose of this early analysis was to ensure that the Project team was knowledgeable and respectful of the history of Aboriginal settlement and relations in the vicinity of the Project and to obtain a general understanding of the communities and groups to be engaged before implementing the Aboriginal engagement program.

The Project team also met with Six Nations of Grand River and Mississaugas of New Credit at this very early stage to provide information about the Project in advance of the local media release.

The First Nations, Métis and Chiefs Councils shown in Table 5-1 have been advised of the Project and will be provided with copies of this Project Description. Figure 5-1 indicates the proximity of the Project site in relation to the Mississaugas of the New Credit First Nation, Six Nations of the Grand River First Nation and the Haldimand Tract.

### Table 5-1: Preliminary List of First Nation, Métis Groups and Chiefs Councils.

<table>
<thead>
<tr>
<th>First Nations</th>
<th>Approximate Distance from Project site (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mississaugas of the New Credit First Nation</td>
<td>21 km</td>
</tr>
<tr>
<td>2 Six Nations of the Grand River</td>
<td>30 km</td>
</tr>
<tr>
<td>3 Chippewas of the Thames</td>
<td>115 km</td>
</tr>
<tr>
<td>4 Oneida Nation of the Thames</td>
<td>110 km</td>
</tr>
<tr>
<td>5 Munsee Delaware Nation</td>
<td>117 km</td>
</tr>
<tr>
<td>6 Moraviantown Delaware Nation</td>
<td>151 km</td>
</tr>
<tr>
<td>7 Caldwell First Nation</td>
<td>224 km</td>
</tr>
<tr>
<td>8 Walpole Island First Nation</td>
<td>200 km</td>
</tr>
<tr>
<td>9 Whata First Nation</td>
<td>245 km</td>
</tr>
<tr>
<td>10 Mohawks of Bay of Quinte First Nation</td>
<td>281 km</td>
</tr>
<tr>
<td>11 Akwesasne First Nation</td>
<td>492 km</td>
</tr>
<tr>
<td>12 Mohawk Council of Kahnawake</td>
<td>586 km</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chiefs Councils</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Haudenosaunee Confederacy Chiefs Council</td>
<td>Various</td>
</tr>
<tr>
<td>14 Southern First Nations Secretariat</td>
<td>Various</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Métis Groups</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Métis Nation of Ontario</td>
<td>N/A</td>
</tr>
<tr>
<td>16 Credit River Métis Council</td>
<td>N/A</td>
</tr>
<tr>
<td>17 Grand River Métis Council</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Lake Erie Connector

Figure 5-1: Proximity of the Project in Relation to the Mississaugas Of The New Credit First Nation, Six Nations Of The Grand River First Nation and The Haldimand Tract

Legend

- Haldimand Tracts (Approximate Boundary)
- First Nations Approximate Boundaries
- Municipal Boundaries
- Converter Station
- Property Boundary
- AC Cable Route
- DC Cable Route
- Lake Erie Connector Preferred Route
- Waterbodies

Date: 1/14/2015

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The Haudenosaunee Confederacy Chiefs Council asserts jurisdiction in respect of the following Iroquois member Nations: Mohawk, Seneca, Onondaga, Cayuga, Oneida and Tuscarora. Many of such members belong to the following communities in Canada and on borders of Ontario/Quebec and USA: Six Nations of Grand River band, as well as Oneida of the Thames, Whata First Nation, Mohawks of the Bay of Quinte, Akwesasne First Nation and Mohawk Council of Kahnawake.

The Southern First Nations Secretariat is a Chiefs Council comprised of the elected Chiefs from the following Nations: Chippewas of the Thames, Oneida Nation of the Thames, Munsee Delaware Nation, Moravian Town Delaware Nation, Caldwell Nation, Aamjiwnaang Nation and Kettle and Stoney Point Nation.

5.3.2 Preliminary Activities and Feedback

Meaningful engagement has been initiated through direct communications with those Aboriginal groups having an interest in the Project. ITC Lake Erie has offered to meet with any Aboriginal group to provide information about the Project. Initial and follow up meetings have taken place to provide preliminary information and discuss protocol requirements of the respective communities and/or groups. In some cases, agreements have been negotiated or are in process of being finalized to guide the engagement process for transparency, to provide cost recovery for technical reviews and to ensure overall participation and feedback through community consultation, where necessary or advisable.

Engagement activities carried out to date is described in Table 5-2.

**Table 5-2: Engagement Activities with of First Nation, Métis Groups and Chiefs Councils.**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Period of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Desktop study and independent historical analysis and research of potentially impacted Aboriginal groups</td>
<td>July/August, 2013</td>
</tr>
<tr>
<td>2 Prepare introductory Project information materials</td>
<td>July/August, 2013</td>
</tr>
<tr>
<td>3 Arrange early pre-consultation meetings at Mississaugas of New Credit and Six Nations of Grand River</td>
<td>August/Sept, 2013</td>
</tr>
<tr>
<td>4 Direct telephone inquiries to determine official contact persons for engagement and consultation</td>
<td>September, 2013</td>
</tr>
<tr>
<td>5 Confirm protocol for mail-outs and direct inquiries and development of a contact and mailing list</td>
<td>September, 2013</td>
</tr>
<tr>
<td>6 Initial Project correspondence to Aboriginal groups</td>
<td>November, 2013</td>
</tr>
<tr>
<td>7 Determine local First Nation publications for media outreach and media outreach for Public Open House #1</td>
<td>December, 2013</td>
</tr>
<tr>
<td>Activity</td>
<td>Period of Activity</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>8 Update letter to Aboriginal groups and carry out media outreach for</td>
<td>July, 2014</td>
</tr>
<tr>
<td>Public Open House #2</td>
<td></td>
</tr>
<tr>
<td>9 Pre-consultation meetings held with the following communities and</td>
<td>January to August, 2014</td>
</tr>
<tr>
<td>organizations:</td>
<td></td>
</tr>
<tr>
<td>o Mississaugas of the New Credit First Nation</td>
<td></td>
</tr>
<tr>
<td>o Six Nations of the Grand River</td>
<td></td>
</tr>
<tr>
<td>o Caldwell First Nation</td>
<td></td>
</tr>
<tr>
<td>o Haudenosaunee Confederacy Chiefs Council</td>
<td></td>
</tr>
<tr>
<td>o Chippewas of the Thames</td>
<td></td>
</tr>
<tr>
<td>o Munsee Delaware Nation</td>
<td></td>
</tr>
<tr>
<td>10 Review and consideration of First Nation protocols and practices</td>
<td>August to December, 2014</td>
</tr>
<tr>
<td>for engagement and consultation based on materials provided by</td>
<td></td>
</tr>
<tr>
<td>Aboriginal groups</td>
<td></td>
</tr>
<tr>
<td>11 Discussion and development of agreements regarding protocols and</td>
<td>August to December, 2014</td>
</tr>
<tr>
<td>engagement processes with the following entities:</td>
<td></td>
</tr>
<tr>
<td>o Mississaugas of the New Credit First Nation</td>
<td></td>
</tr>
<tr>
<td>o Six Nations of the Grand River Elected Council</td>
<td></td>
</tr>
<tr>
<td>o Haudenosaunee Confederacy Chiefs Council</td>
<td></td>
</tr>
<tr>
<td>12 Enter into Monitoring Agreements with Mississaugas of New Credit</td>
<td>August to September, 2014</td>
</tr>
<tr>
<td>and Six Nations of Grand River and arrange for Monitor participation</td>
<td></td>
</tr>
<tr>
<td>in Stage 1 and Stage 2 activities</td>
<td></td>
</tr>
<tr>
<td>13 Pre-consultation meetings held with the following communities:</td>
<td>November to December, 2014</td>
</tr>
<tr>
<td>o Caldwell First Nation</td>
<td></td>
</tr>
<tr>
<td>o Walpole Island First Nation</td>
<td></td>
</tr>
<tr>
<td>o Oneida Nation of the Thames</td>
<td></td>
</tr>
<tr>
<td>14 Arrange for Monitor participation in Stage 3 activities</td>
<td>November, 2014</td>
</tr>
<tr>
<td>15 Enter into Letter of Intent with Mississaugas of New Credit</td>
<td>December, 2014</td>
</tr>
<tr>
<td>16 Direct correspondence to those Aboriginal groups that ITC Lake</td>
<td>December, 2014</td>
</tr>
<tr>
<td>Erie has not met with directly yet to provide copies of the presentation</td>
<td></td>
</tr>
<tr>
<td>materials and a copy of the summary of technical studies delivered in</td>
<td></td>
</tr>
<tr>
<td>recent meetings</td>
<td></td>
</tr>
<tr>
<td>17 Continue to negotiate Memorandum of Understanding</td>
<td>January, 2015</td>
</tr>
</tbody>
</table>
Engagement with Aboriginal communities and organizations as completed to-date indicates that there is interest in:

- Receiving information about the Project to understand Project rationale and assess potential impacts
- Entering into protocol agreements (i.e., memorandums of understanding and reimbursement agreements for engagement activities) and
- Receiving confirmation that ITC Lake Erie will seek consent from certain potentially affected Aboriginal groups as part of the Project approval process
- Participating in archaeology monitoring activities and accessing historical information that may be useful for other purposes
- Understanding the scope of technical studies undertaken in support of the Project and retaining peer review assistance to understand and interpret the technical reports
- Providing early feedback on the technical studies and scope in order to ensure proactive steps are taken to ensure First Nations interests are addressed in the studies
- Undertaking community open house meetings regarding the Project
- Employment opportunities and/or engagement of services available from these communities in support of the Project
- Opportunities for partnership or other forms of economic development activities involving First Nations

### 5.3.3 Confirmation of Aboriginal Groups for Engagement

The Project team’s independent assessment has resulted in 17 potentially interested Aboriginal groups. Upon the submission of the Project Description to the NEB and the Major Projects Management Office (MPMO), the Project team anticipates that the NEB and MPMO will review this list in accordance with the Crown assessment protocols and provide a formal consultation list (Crown Consultation List).

Once the Crown Consultation List is provided to ITC Lake Erie, the formal consultation process will commence and ITC Lake Erie will determine next steps with the listed Aboriginal groups.
6.0 POTENTIAL ENVIRONMENTAL AND SOCIO-ECONOMIC INTERACTIONS OF THE PROJECT

This section provides a preliminary summary of the potential environmental and socio-economic interactions of the Project (see Table 6-1).

Pursuant to NEB requirements, technical studies are being completed to support the comprehensive assessment of the Project’s potential environmental and socio-economic interactions and effects. The technical studies will describe existing conditions, predict potential effects and identify appropriate avoidance, mitigation, and/or compensation/enhancement measures.

The construction and operation of the Project has the potential to interact with various environmental and socio-economic components of the environment. The following provides a preliminary summary of the Project’s potential environmental and socio-economic interactions and the associated technical studies that are being completed to assess the potential interactions. The comprehensive environmental and socio-economic assessment undertaken as part of the NEB application will be based on the results of the technical studies outlined below and will include:

- A description of the environmental and socio-economic setting of the Project area
- An assessment of the environmental effects of the Project
- An assessment of the cumulative effects
- Proposed mitigation measures
- Information on inspection, monitoring, and follow up.
### Table 6-1: Preliminary Summary of the Anticipated Potential Environmental and Socio-economic Interactions.

<table>
<thead>
<tr>
<th>Bio-Physical and Socio-Economic Elements</th>
<th>Circumstances / Interactions Triggering the Need for Detailed Information</th>
<th>Summary of Anticipated Project Interaction(s)</th>
<th>Technical Study that will assess Project interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical and meteorological environment</td>
<td>• The project might affect the morphology of unique physical features (such as physiography, bedrock, permafrost, topography, geology or other local conditions).&lt;br&gt;• The project might be affected by local or regional physical features, meteorological conditions or extremes, or other natural hazards.</td>
<td>Minimal potential interactions are anticipated.&lt;br&gt;• Development of the proposed Haldimand Converter Station will require site preparation activities including site grading and facility foundations interacting with the morphology, topography, and geology of the site during the construction phase.&lt;br&gt;• Buried AC and HVDC cables will have the potential to interact with the morphology, topography, and geology along the preferred cable routes.&lt;br&gt;• There is potential for local or regional physical features, meteorological conditions to affect the underwater HVDC cable in Lake Erie including potential for ice scour during the operations phase.&lt;br&gt;• Potential interactions of Project components with the physical and meteorological environment will be assessed as part of the Geotechnical Assessment, Surface Water Assessment, and Ice Scour Analysis.</td>
<td>• Geotechnical Assessment&lt;br&gt;• Surface Water Assessment&lt;br&gt;• Ice Scour Analysis undertaken as part of the Marine Route Survey.</td>
</tr>
<tr>
<td>Soil and soil productivity</td>
<td>• A portion of the project is located outside a previously developed fenced or gravelled facility site.&lt;br&gt;• A portion of the project is to be buried underground.&lt;br&gt;• Historical land use suggests soils or sediments might contain contaminants.</td>
<td>Minimal potential interactions are anticipated.&lt;br&gt;• The Haldimand Converter Station and preferred cable routes are located in an agricultural field and roadway ROW. The converter station and cables will involve limited sub-surface activities during the construction phase.&lt;br&gt;• Previous studies indicate potential for contaminated sediments on the bed of Lake Erie, with contaminant concentrations that have improved over time. No soil or sediment contamination is anticipated on the</td>
<td>• Geotechnical Assessment&lt;br&gt;• In-Water Marine Survey (Geotechnical) Phase I Environmental Site Assessment</td>
</tr>
</tbody>
</table>
### Bio-Physical and Socio-Economic Elements

#### Circumstances / Interactions Triggering the Need for Detailed Information

- Potential interactions of Project components with the soil and soil productivity will be assessed as part of the Geotechnical Assessment, In-Water Marine Survey (Geotechnical) and Phase 1 Environmental Site Assessment.

### Vegetation

- A portion of the project is located outside a previously developed fenced or gravelled facility site.
- A portion of the project crosses through an area that will require ongoing vegetation control to protect conductors or towers.

#### Summary of Anticipated Project Interaction(s)

- Minimal potential interactions are anticipated.
- The proposed Haldimand Converter Station location is not within 30 m of watercourse or water body and the proposed surface water management plan will maintain existing water quality and quantity on/on site.

### Water quality and quantity

- The project is within 30 m of a water body.
- The project involves the potential for a reduction in quality or quantity of water.
- The project involves the likely release or leaching of a polluting substance into a water body or groundwater.
- The project could result in a change in groundwater flows.
- The project could result in the inter-basin transfer of water.
- There is outstanding concern about this element of the project, which has not been resolved through consultation.

#### Summary of Anticipated Project Interaction(s)

- Minimal potential interactions are anticipated.
- A large portion of the HVDC cable will be constructed and operated underwater within Lake Erie. Proposed construction methods will minimize potential effects to water quality during the construction phase. Potential interaction of Project components with the waters of Lake Erie during construction will be determined through the Water Quality Assessment.

#### Technical Study that will assess Project interaction

- Natural Environment Assessment
- Geotechnical Assessment
- Surface Water Assessment
- Water Quality Model and Study (Lake Erie)
<table>
<thead>
<tr>
<th>Bio-Physical and Socio-Economic Elements</th>
<th>Circumstances / Interactions Triggering the Need for Detailed Information</th>
<th>Summary of Anticipated Project Interaction(s)</th>
<th>Technical Study that will assess Project interaction</th>
</tr>
</thead>
</table>
| Fish and fish habitat                  | • The project is within 30 m of a fish-bearing water body or its tributaries.  
• The project involves activities that could result in the deposit of a polluting substance or a deleterious substance into a fish-bearing water body.  
• The project triggers a more detailed fisheries assessment by DFO as a result of local sensitivities of fisheries (e.g., in British Columbia).  
• There is outstanding concern about this element of the project, which has not been resolved through consultation. | Minimal potential interactions are anticipated.  
• The proposed Haldimand Converter Station location is not within 30 m of fish-bearing water body or tributary.  
• A large portion of the HVDC cable will be constructed and operated underwater within Lake Erie. Operation of the Project will not result in the release of polluting or deleterious substances. Potential interaction of Project components during construction with the waters of Lake Erie will be determined through the Water Quality Assessment.  
• Potential effects on fish and fish habitat will also be considered as part of the Natural Environment Assessment. | • Natural Environment Assessment  
• Water Quality Model and Study (Lake Erie) |
| Wetlands                               | • The project involves activities within 30 m of a wetland.  
• The project involves activities within limits established regionally, provincially, territorially or federally of a wetland with provincial, territorial, regional or federal status.  
• The project could result in loss of wetland functions.  
• There is outstanding concern about this element of the project, which has not been resolved through consultation. | No potential interactions are anticipated as no wetlands have been identified within 30m of the proposed Haldimand Converter Station or preferred cable routes. This will be further described in the Natural Environment Assessment. | • Natural Environment Assessment |
### Bio-Physical and Socio-Economic Elements

<table>
<thead>
<tr>
<th>Wildlife and Wildlife Habitat</th>
<th>Circumstances / Interactions Triggering the Need for Detailed Information</th>
<th>Summary of Anticipated Project Interaction(s)</th>
<th>Technical Study that will assess Project interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The project is located on or near lands that might constitute sensitive habitat for wildlife (e.g., nesting, denning, overwintering, migratory/staging, movement corridors, forest interior habitat, mineral licks)</td>
<td>Minimal potential interactions are anticipated.</td>
<td>• Natural Environment Assessment</td>
<td></td>
</tr>
<tr>
<td>• The project is located on or near an environmentally significant area such as National Parks, Areas of Natural or Scientific Interest, Migratory Bird Sanctuaries, National Wildlife Areas, Important Bird Areas, World Biosphere Reserves, or designated Environmental Sensitive Area.</td>
<td></td>
<td>• Water Quality Model and Study</td>
<td></td>
</tr>
<tr>
<td>• The project will create new access opportunities to important wildlife habitat.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The project may result in a loss of wildlife habitat function (e.g., habitat fragmentation or edge effect).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The project may result in increased mortality or disturbance of wildlife.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• There is outstanding concern about this element of the project, which has not been resolved through consultation.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Species at Risk or Species of Special Status and Related Habitat

<table>
<thead>
<tr>
<th>Circumstances / Interactions Triggering the Need for Detailed Information</th>
<th>Summary of Anticipated Project Interaction(s)</th>
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</thead>
<tbody>
<tr>
<td>• The study area includes lands that occur within the identified range of a Species at Risk or Species of Special Status, and includes habitat that could support these species.</td>
<td>Minimal potential interactions are anticipated.</td>
<td>• Natural Environment Assessment</td>
</tr>
<tr>
<td>• There is outstanding concern about this element of the project, which has not been resolved through consultation.</td>
<td></td>
<td>• Water Quality Model and Study</td>
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<tr>
<td>• The proposed Haldimand Converter Station occurs within the identified range of a Species at Risk. However, based on the results field carried out to date as part of the Natural Environment Assessment, it has been determined that the site does not include habitat that could support the species.</td>
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<tr>
<td>• The preferred AC / HVDC cable routes do not occur within the range of Species at Risk.</td>
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<tr>
<td>• The underwater HVDC cable route occurs near the edge of the range of one fish Species at Risk. Use of HDD for installation of the HVDC cable in the near shore environment will avoid potential fish spawning areas.</td>
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<tr>
<td>Bio-Physical and Socio-Economic Elements</td>
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</tr>
<tr>
<td>Air quality</td>
<td>• There is potential for public concern about effects arising from construction related activities (e.g., dust, or emissions from equipment).</td>
<td>• Potential interactions of Project components with Species at Risk will be assessed as part of the Natural Environment Assessment.</td>
</tr>
</tbody>
</table>
| Acoustic environment                    | • The project will have the potential to result in increased noise levels during operations.  
• There is potential for public concern about effects arising from construction related activities (e.g., blasting, or noise from construction traffic). | • Minimal potential interactions are anticipated.  
• Emissions from construction related equipment will be minimal and temporary.  
• No emissions are associated with the AC or HVDC cables.  
• A Screening Level Air Emissions assessment completed for the Haldimand Converter Station indicates that any emissions from equipment in the station will be well below Ontario emission thresholds. | • Screening Level Air Emissions Assessment |
| Human occupancy and resource use         | • The project will not be located entirely within a previously developed facility site, on company fee-simple land, zoned for industrial purposes.  
• The project will have the potential to result in radio and television interference.  
• There is outstanding concern about this element of the project, which has not been resolved through consultation. | • Minimal potential interactions are anticipated.  
• Measures will be implemented to address noise emissions from the Haldimand Converter Station.  
• Noise modelling to date indicates that potential noise emissions from the proposed HVDC Converter Station will meet applicable provincial and municipal regulations.  
• No noise will be emitted during the operation of the AC / HVDC cables.  
• Potential noise emissions from the Project will be assessed as part of the Acoustic Assessment. | • Acoustic Assessment  
• Social, Cultural and Economic Assessments |
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<td>Heritage resources</td>
<td>The project will entail groundbreaking activities including clearing of vegetation, grading, trenching, excavating or drilling.</td>
<td>Potential interactions are anticipated.</td>
<td>- Stage 1 Archaeological Assessment (Terrestrial and Marine)</td>
</tr>
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<td></td>
<td>The project will create new access opportunities to areas with heritage resources or resource potential.</td>
<td></td>
<td>- Stage 2 Archaeological Assessment (Terrestrial and Marine)</td>
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<tr>
<td></td>
<td>There is outstanding concern about this element of the project, which has not been resolved through consultation.</td>
<td></td>
<td>- Stage 3 Archaeological Assessment (Terrestrial)</td>
</tr>
<tr>
<td></td>
<td>Potential navigation and navigation safety</td>
<td></td>
<td>- Cultural Heritage Assessment</td>
</tr>
<tr>
<td>Navigation and navigation safety</td>
<td>The project includes activities to be conducted or components to be located in, on, over, under, through or across a navigable waterway when the water is flowing (i.e., not seasonally dry or frozen)</td>
<td>Minimal potential interactions are anticipated.</td>
<td>- Cable Installation Methodology</td>
</tr>
<tr>
<td></td>
<td>There is outstanding concern about this element of the project, which has not been resolved through consultation.</td>
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### Bio-Physical and Socio-Economic Elements

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<tr>
<th>Detailed Information</th>
<th>Summary of Anticipated Project Interaction(s)</th>
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| Traditional land and resource use | - The project will be located on, or traverse, Crown land or the traditional territory, reserve land or settlement area of an Aboriginal group.  
- There is outstanding concern about this element of the project, which has not been resolved through consultation. | Potential interactions are anticipated.  
- Aboriginal communities and groups in the vicinity of the Project are being engaged including:  
  - Mississaugas of the New Credit First Nation  
  - Six Nations of the Grand River Elected Council  
  - Six Nations Haudenosaunee Confederacy Council as represented by Haudenosaunee Development Institute  
  - Mohawks of Bay of Quinte First Nation  
  - Akwesasne First Nation  
  - Whata First Nation  
  - Mohawk Council of Kahnawake  
  - Metis Nation of Ontario, including the Credit River Metis Council and Grand River Metis Councils  
  - Chippewas of the Thames  
  - Oneida Nation of the Thames  
  - Munsee Delaware Nation  
  - Moravianstown Delaware Nation  
  - Caldwell First Nation  
  - Walpole Island First Nation  
  - Southern First Nations Secretariat | NEB Election Certificate application |
| Social and cultural well-being | - The project will have the potential to affect the social and cultural well-being of local residents or communities.  
- There is outstanding concern about this element of the project, which has not been resolved through consultation. | Potential interactions are anticipated.  
- The Project is estimated to result in the generation of a number of direct and indirect jobs during the 2 year construction period.  
- Increased income tax and property tax revenues are associated with the Project.  
- The Project provides an export opportunity for Ontario’s surplus baseload generation and an import opportunity when Ontario needs power. | Social, Cultural and Economic Assessments |
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| **Human health and aesthetics**        | • The project will have the potential to negatively affect local or regional water quality and quantity or air quality.  
• The project will change the existing environmental setting related to electromagnetic fields, visual aesthetics or other sensory conditions.  
• There is outstanding concern about this element of the project, which has not been resolved through consultation. | • Minimal potential interactions are anticipated.  
• See Water Quality and Quantity above.  
• See Air Quality above.  
• There will be minimal to no change in the electromagnetic fields associated with the Project. Electromagnetic fields generated by the AC cables, are expected to be below international exposure guidance. Electromagnetic fields generated by HVDC cables are static and similar to the earth’s magnetic field. Electromagnetic fields emitted by this type of Project will be assessed in an Electromagnetic Field Assessment.  
• The proposed Haldimand Converter Station has been sited to minimize potential effects on the visual landscape. It is situated behind an existing wooded area minimizing view from nearby receptors. It is located in an area that has several large scale industrial facilities. Potential effects on the visual landscape will be assessed as part of the Visual Assessment. | • Surface Water Assessment  
• Screening Level Air Emissions Assessment  
• Electromagnetic Field Assessment  
• Visual Assessment |
| **Infrastructure and services**         | • The project will cause damage to, or require additions, modifications or repairs to local or regional infrastructure.  
• The project will result in increased demands on local and regional services.  
• There is outstanding concern about this element of the project, which has not been resolved through consultation. | • Minimal potential interactions are anticipated.  
• The proposed Haldimand Converter Station will require local servicing including electricity. Water service requirements are being investigated.  
• The installation of the AC/HVDC cable may result in the temporary disruption to local roadway and utilities. | • Social, Cultural and Economic Assessments |
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<td>consultation.</td>
<td>• The Project will result in minimal increased demand on local and regional services.</td>
<td>• Potential interactions and effects on infrastructure and services will be assessed as part of the Social, Cultural and Economic Assessments.</td>
<td></td>
</tr>
<tr>
<td>Employment and economy</td>
<td>• The project will, either positively or negatively, affect local and regional employment, procurement and contracting conditions or government revenues.</td>
<td>Potential interactions are anticipated.</td>
<td>• Social, Cultural and Economic Assessments</td>
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<td>• There is outstanding concern about this element of the project, which has not been resolved through consultation.</td>
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