Phase 1 New Transmission Line to Pickle Lake Project

Draft Environmental Assessment Report

Pursuant to:
Ontario Environmental Assessment Act

Submitted by:
Wataynikaneyap Power L.P.

Issued June 2017
EXECUTIVE SUMMARY

Introduction and Project Overview

A grouping of 22 First Nation communities have joined together (through the First Nation Limited Partnership [FNLP], formally known as the Central Corridor Energy Group [CCEG]), in partnership with FortisOntario Inc. (FortisOntario), to form a licenced transmission company, the Wataynikaneyap Power Limited Partnership (Wataynikaneyap) to develop, construct, operate, and own the Wataynikaneyap Power Project. The Wataynikaneyap Power Project is being developed in two phases. Phase 1, the New Transmission Line to Pickle Lake Project (the Project), is an approximately 300 kilometre (km) long, 230 kilovolt (kV) transmission line from the Dryden / Ignace area to Pickle Lake in northwestern Ontario. Phase 2 includes approximately 1,500 km of 115 kV and 44 kV transmission lines for subsystems north of Pickle Lake and Red Lake that will connect 17 remote First Nation communities, currently powered by diesel generation, to the provincial electrical grid. The Phase 1 Project enables the Phase 2 project by reinforcing the grid and increasing electrical supply capacity available at the Pickle Lake substation.

Transmission service on the Ontario electricity grid in northwestern Ontario terminates at the community of Pickle Lake. Ontario’s remote First Nation communities currently rely on diesel generation for their electricity supply; however, diesel fuel is expensive, difficult to transport, and poses environmental and health risks. In addition, a lack of affordable and reliable power contributes to poor living conditions and constrained community growth (e.g., housing and community infrastructure). Transmission reliability and expansion to Pickle Lake has been identified in Ontario’s Achieving Balance Long-Term Energy Plan (released in November 2013) as a key priority for the connection of Aboriginal communities in northwestern Ontario to the provincial grid. The Ontario Power Authority developed a draft plan for remote community connections beyond Pickle Lake. This draft plan identified a strong economic case for connecting remote Aboriginal communities with new transmission lines. The Ontario Power Authority’s study showed that over the next 40 years, grid connection could be 30% to 40% less expensive than continued use of diesel fuels. The Project is expected to provide the following net benefits:

- Increase in labour demand from direct employment, indirect employment, and induced employment.
- Contracting opportunities and spending by local and regional consumers and service oriented businesses of wages and income from the Project will support economic development in the Project study areas.
- Positive contribution to government net revenues through income and other taxes.

By enabling the Phase 2 Project, the following additional benefits will be realized:

Environmental Benefits:

- **Fewer Fuel Spills and Contamination:** Reduced risks and lower number/volume of transport, storage and consumption based oil spills and contamination due to substantive reduction in the use of diesel fuel for electricity and space/water heating.
- **Reduced Greenhouse Gas Emissions:** Major reduction in greenhouse gas emissions due to replacement of diesel fuel requirements with grid-based electricity.
- **Enhanced Environmental Resilience:** Enhanced environmental reliance in northern Ontario due to:
  - reduced reliance on ice road and transport infrastructure and fuel storage;
elimination of emergency fuel deliveries by air related to poor ice road conditions (climate change); and
substantial reduction in greenhouse gas emissions from diesel generation.

First Nation Social and Community Development Benefits:

- **Reduced Health Risk:** Diesel fuel increases risks to human health. The transport and storage of fuel is an occupational health risk. Diesel-based power generation and furnace emissions from fuel oil, lead to poor indoor air quality, which can exacerbate respiratory, heart and other ailments.

- **Community Quality of Life:** The effect of replacing unreliable, poor quality diesel electricity with cleaner, cheaper and much more reliable grid power has a range of positive benefits on community quality of life (e.g., noise).

- **Community Infrastructure:** The positive effects of continued operations, lower maintenance costs and longer infrastructure lifespans as a consequence of introducing grid power to replace local diesel electricity.

First Nations and Regional Economic Development Benefits:

- **Employment and Jobs:** Direct construction, operating and management jobs created through the Project.

- **Skills Development:** Skills development, job qualifications and experience obtained by First Nation peoples through development, planning, construction, operation and ownership/management of the Project.

- **Economic Development (Energy and Business):** Transmission infrastructure investment leads to three types of beyond construction types of economic development:
  - the opportunity to develop clean energy projects to feed into the system;
  - community-based economic development based on the availability of clean, reliable grid power; and
  - commercially driven economic development by small businesses: that utilizes grid power for their operations.

Ontario and Canada Economic Development Benefits:

- **Infrastructure and Natural Resource Competitiveness:** The benefits associated with having grid power infrastructure to support natural resources development and competitiveness in northwestern Ontario.

- **Tax Revenue:** A projection of provincial and federal tax revenue generated through the Wataynikaneyap Project, including income (personal, corporate and payroll) and consumption (sales and excise) taxes.

- **Infrastructure Investment Multipliers:** A projection of the additional economic benefits arising from the Project through multiplier effects from investment and job creation.

This Draft Environmental Assessment Report is for the Phase 1 New Transmission Line to Pickle Lake Project (the Project), which is subject to an Individual Environmental Assessment under the Ontario Environmental Assessment Act. This Draft Environmental Assessment Report is being submitted by Wataynikaneyap, as proponent, in accordance with the Amended Terms of Reference approved by the Minister of Environment and Climate Change in February 2015.
Engagement Summary

Aboriginal and stakeholder engagement is a key component of the environmental assessment process. Aboriginal and stakeholder engagement is being undertaken by Wataynikaneyap to inform the public and Aboriginal groups about the Project and the environmental assessment process.

Two rounds (Round 1 and Round 2) of engagement were completed during the preparation of the Terms of Reference and were discussed in detail in the Record of Engagement that accompanied the approved Amended Terms of Reference.

Round 3 engagement was divided into two parts. Part 1 focused on the development of the environmental assessment method and Project design including the development of Draft environmental assessment criteria and indicators, traditional land and resource use input, input into Project design, and evaluation of engagement efforts. Round 3, Part 1 engagement was completed between June 2015 and May 2017.

Part 2 will be completed after the Draft Environmental Assessment Report is submitted and will focus on providing the following information:

- reviewing results of baseline studies;
- reviewing results of the effects assessment, including the opportunity to review the Draft EA Report;
- recommended impact management measures;
- reviewing results of the final corridor routing analysis to identify a preferred corridor; and
- evaluation of engagement efforts through comment and evaluation forms.

During Round 3, Part 1, Wataynikaneyap implemented a variety of engagement methods to facilitate understanding of the Project and the EA process. These methods included notifications, letter, phone calls, emails, letters and meetings. A Project website was developed to provide comprehensive Project information including updated information on Wataynikaneyap (including contact information), the Project, a Project map, the environmental assessment process and schedule, and frequently asked questions.

Aboriginal Engagement

A Memorandum of Understanding was signed on November 23, 2016 between Wataynikaneyap and the Ministry of Energy, as a representative of the Crown. The Memorandum of Understanding delegates procedural aspects of consultation to Wataynikaneyap and its purpose is to clarify which rights-based Aboriginal consultation activities will carried out respectively by the Crown and Wataynikaneyap. Consultation undertaken in the course of fulfilling environmental assessment requirements assists the Crown representatives in meeting their duty to consult with respect to rights and interests on the Project. The Memorandum of Understanding lists the Aboriginal communities to be engaged and details the roles and responsibilities of the Crown and Wataynikaneyap. The engagement activities being completed by Wataynikaneyap also include relationship-building activities that extend beyond the procedural requirements of consultation, and will therefore be termed ‘engagement’. It is recognized that the ultimate responsibility for meeting any duty to consult rests with the Crown.
Aboriginal communities and groups to be engaged for the Project were identified in the Memorandum of Understanding. Wataynikaneyap expanded on the communities and groups identified in the Memorandum of Understanding for engagement, which was originally implemented during the Terms of Reference process. The communities and groups were grouped by Wataynikaneyap into the following three groups:

- **Group 1** Aboriginal communities identified in the MOU, Cat Lake First Nation, and Eabametoong First Nation are identified as Group 1 communities whose Aboriginal and Treaty Rights may be affected by the Project.

- **Group 2** Group 2 includes Aboriginal communities and Aboriginal groups responsible for administering traditional lands and land use plans that may be affected by the Project.

- **Group 3** Aboriginal communities who are identified as being potential new customers of Phase 2 and/or owners of Wataynikaneyap.

### Table 1: Aboriginal Communities and Groups Engaged

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<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
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<tbody>
<tr>
<td>Eagle Lake First Nation</td>
<td>Nishnawbe Aski Nation (NAN)</td>
<td>Bearskin Lake First Nation</td>
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<td>Lac Seul First Nation</td>
<td>Grand Council of Treaty #3, including the Bimose Tribal Council, Wabauskang First Nation, Lac des Mille Lacs First Nation, and Asubpeechoseewagong Netum Anishinabek(a)</td>
<td>Deer Lake First Nation</td>
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<tr>
<td>Mishkeegogamang First Nation (partnered with Eabametoong First Nation in the Eabametoong and Mishkeegogamang First Nations Community Based Lane Use Plan)(b)</td>
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<td>Kasabonika First Nation</td>
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<td>Ojibway Nation of Saugeen First Nation</td>
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<td>Keewaywin First Nation</td>
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<td>Slate Falls Nation</td>
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<td>Kingfisher Lake First Nation</td>
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<td>Cat Lake First Nation (partnered with Slate Falls Nation in the Cat Lake Slate Falls Community Based Land Use Plan)</td>
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<td>Kitchenuhmaykoosib Inninuwug</td>
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<tr>
<td>Eabametoong First Nation (partnered with Mishkeegogamang First Nation in the Eabametoong and Mishkeegogamang First Nations Community Based Lane Use Plan)</td>
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<td>McDowell Lake First Nation</td>
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<td>Wabigoon Lake Ojibway Nation</td>
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<td>Muskrat Dam First Nation</td>
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<td>Métis Nation of Ontario Region 1 Consultation Committee (MNO R1CC)(c)</td>
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<td>North Caribou First Nation</td>
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<td>North Spirit Lake First Nation</td>
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<td>Pikangikum First Nation</td>
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Notes:

a) As part of the engagement with Grand Council of Treaty #3, Wataynikaneyap is also engaging Bimose Tribal Council, Wabauskang First Nation, Lac des Mille Lacs First Nation, and Asubpeechoseewagong Netum Anishinabek (Grassy Narrows First Nation), as they have expressed interest in the Project.

b) The Taashikaywin Land Use Planning Group.

c) Métis Nation Region 1 Consultation Committee is made up of the Northwest Métis Council, Kenora Métis Council, Atikokan and Area Métis Council, and Sunset County Métis Council.

June 2017
Project No. 1535751

ES-4
Wataynikaneyap completed one round of engagement (Round 1) and partially completed Round 2 engagement during the Terms of Reference stage of the environmental assessment process. The methods and results of Round 1 and Round 2 were provided in the Aboriginal and Stakeholder Record of Engagement submitted along with the Amended Terms of Reference in November 2014 and therefore will not be discussed here. The Amended Terms of Reference Record of Engagement can be found on the Wataynikaneyap website (www.wataypower.ca).

Wataynikaneyap has completed extensive engagement during the environmental assessment stage of the process, starting with the distribution of the Notice of Commencement of Environmental Assessment (Notice) in April 2015 that was provided to all identified Aboriginal communities. Round 3, Part 1 engagement started shortly after distribution of the Notice. This round of engagement focussed on the development of the Draft environmental assessment criteria and indicators that are used in the Draft Environmental Assessment Report, input on Project design, and the collection of traditional land and resource use data to inform the Aboriginal Rights and Treaty Rights assessment. In order to solicit extensive feedback on the Draft environmental assessment criteria and indicators and Project design, Wataynikaneyap completed a number of workshops and information sessions with Group 1 communities. At these workshops, Wataynikaneyap provided a Project and environmental assessment overview presentations, presented the environmental assessment criteria and indicators for discussion and feedback, and provided a workbook to attendees that included the presentations, the environmental assessment criteria and indicators, Project mapping and contact information. Detailed maps of the transmission corridors along with preliminary project locations (e.g., 40-m-wide transmission line alignment right-of-way, construction camps) were available for viewing at workshops. Wataynikaneyap also provided a Project terminology sheet, and comment and evaluation forms in English, Ojibway and Oji-cree.

Wataynikaneyap did not receive feedback on the environmental assessment criteria and indicators during the workshops and information sessions. Key issues and concerns raised during the Aboriginal engagement events related to Project design, surface water, air quality, noise, vegetation fish, wildlife, socio-economics, land and resource use, and Aboriginal use of land. These issues and concerns have been incorporated into the effects assessment.

**Stakeholder Engagement**

A stakeholder participant list was developed based on engagement efforts to date, review of publicly available government agency contacts, community websites, and experience with other projects within the same geographic region. Stakeholders identified include:

**General Public:**
- landowners and residents within the 2-km-wide corridors;
- businesses within the 2-km-wide corridors and in Pickle Lake, Ignace, Sioux Lookout and Dryden (e.g., tourism operators);
- self-identified Crown land tenure and claim holders; and
- self-identified members of the public;

**Non-Governmental Organizations:**
- environmental groups;
- community-based organizations;
Government Agencies:

- Government Review Team;
- Federal government: local and area Members of Parliament, departmental and agency staff;
- Provincial government: local and area Members of Provincial Parliament, ministry and agency staff; and
- Local municipal and district councils, agencies and staff.

Wataynikaneyap completed workshops with regulatory agencies, municipal governments, and non-governmental agencies during Round 3, Part 1 to seek feedback and confirm the environmental assessment criteria and indicators, which are used as a basis for discipline-specific effects assessments. Wataynikaneyap completed workshops with the Government Review Team and non-governmental organizations in Toronto, and municipal governments, local non-governmental organizations and other local stakeholders in Sioux Lookout. At these workshops, Wataynikaneyap provided a Project and environmental assessment overview presentations, presented the environmental assessment criteria and indicators for discussion and feedback, and provided a workbook to attendees that included the presentations, the environmental assessment criteria and indicators, Project mapping and contact information. Detailed maps of the transmission corridors along with preliminary project locations (e.g., 40-m-wide transmission line alignment right-of-way, construction camps) were available for viewing at workshops.

Wataynikaneyap also completed meetings with key regulatory agencies and select non-governmental organizations. During Round 3, Part 1, these meetings focussed on woodland caribou, parks and protected areas, environmental assessment criteria and indicators, and effects assessment methods.

Wataynikaneyap received a great deal of valued feedback on the initial Draft environmental assessment criteria and indicators that were first presented for review during the targeted workshops and information sessions and from input at regulatory meetings. The resulting list of the final environmental assessment criteria and indicators is based on this round of extensive engagement. The final list of environmental assessment criteria and indicators, along with a Project and environmental assessment update, were provided in a newsletter that was distributed to stakeholders in February 2017.

Key issues and concerns raised during the stakeholder workshops and information sessions related to parks and protected areas, wildlife, surface and groundwater, socio-economics, land and resource use, Project design, and climate change. These issues and concerns were incorporated into the effects assessment.
Project Description

The Project includes the construction, operation and maintenance, and retirement of a proposed alternating current electricity transmission system in northwestern Ontario (Figure 1). The proposed Project includes the following main components:

- an overhead alternating current transmission line and associated components that will be located within a 2-km-wide corridor approximately 300 km in length. Based on the outcome of a preliminary corridor routing analysis completed for the Amended Terms of Reference and the results of engagement, three corridors have been identified, as follows:
  - a Preliminary Proposed Corridor originating in Dinorwic (east of Dryden), and extending north to terminate at Pickle Lake;
  - two Corridor Alternatives originating in the Ignace area, as follows:
    - Corridor Alternative Around Mishkeegogamang – a corridor alternative that travels west around Mishkeegogamang First Nation extending north to terminate at Pickle Lake, and
    - Corridor Alternative Through Mishkeegogamang – a corridor alternative that travels east through Mishkeegogamang First Nation and also terminates at Pickle Lake.
- connection facility to serve as a connection between the Project transmission line and an existing 230 kV line owned and operated by Hydro One. The connection facility for the Preliminary Proposed Corridor is proposed to be located at Dinorwic, and the connection facility for the two Ignace to Pickle Lake corridor alternatives is proposed to be located approximately 20 km west of Ignace;
- a transformer station and ancillary components is proposed at Pickle Lake to provide for connection and switching of the 115 kV alternating current transmission line to existing Hydro One and the Musselwhite Mine transmission lines; and
- temporary structures associated with construction, including but not limited to construction camps, access roads or trails, laydown areas, turn-around areas, watercourse crossings, and waste management and staging areas.

During the environmental assessment stage, Wataynikaneyap continued to further refine the Project design through a narrowing of the initial 2-km-wide corridors identified in the Amended Terms of Reference to preliminary proposed 40-m-wide transmission line alignment right-of-way and identification of preliminary proposed location of Project components (e.g., access roads / trails, construction camps). The 40-m-wide transmission line alignment right-of-way is where the eventual transmission line will be constructed and operated. This narrowing process was completed via a continual feedback mechanism with the consideration of environmental constraints, baseline studies and results of effects assessment, feedback from Aboriginal and stakeholder engagement, and completion of traditional land and resource use studies.
LEGEND

Phase 1
- Preliminary Proposed 2-km-wide Corridor
- Corridor Alternatives 2-km-wide Corridor

Phase 2
- Preliminary Proposed 2-km-wide Corridor
- City
- Town
- Wataynikaneyap Power Community (First Nation Community)
- First Nation Community

railway
- MAJOR ROADS AND HIGHWAYS
- Winter Road
- Waterbody
- Provincial Parks
- First Nation Reserve Land
- Utility Lines
- Existing Electrical Transmission Line
- Natural Gas Pipeline

B.C.

MANITOBA

Currently, the project is focused on two phases:

**Phase 1**
- New Transmission Line to Pickle Lake

**Phase 2**
- Continuation of the transmission line project

**Project Location**

**Consultant:** Wataynikaneyap Power

**Title:** Phase 1 New Transmission Line to Pickle Lake Project

**Client:** Wataynikaneyap Power L.P.

**Reference(s):**
1. Base data - MNRF LIO and NTDB, obtained 2016
2. Phase 1 corridors - Provided by Wataynikaneyap Power L.P. and Senes
4. First Nation communities from Indigenous and Northern Affairs Canada (www.AINC-INAC.gc.ca)

**Data Source:** Golder Associates

**Projected:** Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15

**Figure:** 1

**Project No.:** 1535751

**Approved:** MH

**Prepared:** JMC

**Designed:** JMC

**Drafted:** 2017-06-09
As per the Amended Terms of Reference, the three corridors (Preliminary Proposed Corridor, Corridor Alternative Around Mishkeegogamang, and Corridor Alternative Through Mishkeegogamang) were assessed in the Draft Environmental Assessment Report; and a final corridor routing analysis was completed to determine the preferred undertaking. The final corridor routing analysis is based on the comparative analysis completed for each discipline of the adverse net effects, using environmental assessment criteria and indicators, cost and constructability criteria, and technical criteria. Based on this analysis, the Preliminary Proposed Corridor was identified as the preferred undertaking for the Project.

Wataynikaneyap will be continuing with its technical analysis during detailed design of the selected preferred transmission corridor. This analysis may result in a refinement the 40-m-wide transmission line alignment right-of-way and the locations of access roads or trails and other Project components associated with construction (e.g., construction camps, turn-around areas, laydown areas). For this purpose, Wataynikaneyap proposes that a limits of work of 200 m on either side of the 40-m-wide transmission line alignment right-of-way for the environmental assessment approval and subsequent permitting purposes. Thus, potential location revisions to the preliminary Project locations identified in this Draft Environmental Assessment Report and in applicable permits would be limited to this limits of work.

Any potential revisions within the limits of work are not anticipated to change the conclusions of the predicted effects and significance determination; as Wataynikaneyap will commit to incorporating impact management measures identified in the draft Environmental and Social Management Plan.

**Environmental Effects Assessment Methods**

The environmental assessment methods applied to each discipline generally includes the following main steps:

- describe the Project;
- identify environmental criteria that may interact with the Project to focus the assessment, done in engagement with Aboriginal people, government agencies, and other interested parties;
- define the spatial and temporal boundaries for the assessment of criteria, and the assessment cases used to assess the effects of the Project;
- describe the existing environment (i.e., Base Case) specific to each criterion in which the Project will be constructed and operated;
- identify potential Project-environment interactions (i.e., effects pathways) and impact management measures to avoid or minimize effects;
- screen effects pathways to focus the assessment on pathways with potential for net effects following implementation of impact management measures;
- predict and characterize net effects (i.e., after impact management measures) of the Project on environmental criteria and determine their significance (i.e., Project Case);
- predict and characterize cumulative effects of the predicted Project Case net effects in combination with other past, present, and reasonably foreseeable developments and activities, and determine their significance (i.e., reasonably foreseeable development [RFD] Case);
ENIRONMENTAL ASSESSMENT REPORT FOR THE PHASE 1 NEW TRANSMISSION LINE TO PICKLE LAKE PROJECT

- identify key factors influencing confidence in effects predictions and how uncertainty is managed so Project effects are not underestimated; and
- identify monitoring programs that will be completed during and after construction to evaluate the effectiveness of impact management measures, verify predictions made in the Draft Environmental Assessment Report, address environmental issues identified during Project operation and maintenance, and provide feedback for adaptive management.

Criteria are components of the environment that are considered to have economic, social, biological, conservation, aesthetic or cultural value.

Table 2: Criteria Assessed in the Environmental Assessment

<table>
<thead>
<tr>
<th>Physical Environment</th>
<th>Biological Environment</th>
<th>Social Environment</th>
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<tbody>
<tr>
<td>Air quality</td>
<td>Fish and fish habitat:</td>
<td>Aboriginal and Treaty Rights and Interests</td>
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<tr>
<td>Greenhouse gases</td>
<td>▪ Brook Trout</td>
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<tr>
<td>Noise</td>
<td>▪ Lake Trout</td>
<td>Aboriginal and Treaty Rights and Interests</td>
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<tr>
<td>Surface water</td>
<td>▪ Walleye</td>
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<td>▪ Lake Sturgeon</td>
<td>Aboriginal and Treaty Rights and Interests</td>
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<td>Vegetation and wetlands</td>
<td>Upland Ecosystems</td>
<td>Archaeological resources</td>
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<td></td>
<td>▪ Riparian ecosystems</td>
<td>Archaeological resources</td>
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<td></td>
<td>▪ Wetlands</td>
<td>Archaeological resources</td>
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<td>Wildlife:</td>
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<td>Built heritage and cultural heritage landscapes</td>
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<td>▪ Moose</td>
<td>Built heritage and cultural heritage landscapes</td>
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<tr>
<td></td>
<td>▪ Wolverine</td>
<td>Built heritage and cultural heritage landscapes</td>
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<td>▪ Little brown myotis</td>
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<td>▪ Horned grebe</td>
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<td>▪ Canada warbler</td>
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<td>▪ Barn swallow</td>
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<td>▪ Common nighthawk</td>
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<td>▪ Olive-sided flycatcher</td>
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<td>Landscape and visual resources</td>
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<td>Human health</td>
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Project No. 1535751 ES-10
Physical Environmental Base Case and Effects Assessment

Surface Water

Base Case

The Project is located in the Nelson River and Southwest Hudson Bay primary watersheds and six tertiary watersheds including: 5QC-Wabigoon, 5QA-Upper English, 5QE-Central English-Lac Seul, 4GA-Upper Albany-Cat, 4FA-Otoskwin, and 4GB-Upper Ogoki. The areas of these watersheds crossed by the Project generally drain either northwest towards the Nelson River or northeast towards Hudson Bay.

The Preliminary Proposed Corridor crosses 269 watercourses and 31 lakes. The Corridor Alternative Around Mishkeegogamang crosses 177 watercourses and 48 lakes. The Corridor Alternative Through Mishkeegogamang crosses 172 watercourses and 47 lakes. These surface water features generally drain to Hudson Bay (via the English River and Lake Winnipeg, the Albany River, or the Attawapiskat River), and range from small headwater ponds to large rivers with catchments exceeding 26,400 square kilometres (km²). The surficial geology of the watersheds is dominated by bedrock with instances of glaciolacustrine deposits, glaciofluvial deposits and till, while land cover is characterized by mostly forest.

Six Permits to Take Water are active within the Project study areas (six along the Preliminary Proposed Corridor and three along the corridor alternatives), mostly providing water supply around Sioux Lookout and Pickle Lake. In addition, a total of five hydropower generating stations are located within the regional study areas.

Surface water flows and water levels in the watersheds crossed by the Project are largely controlled by snowmelt and rainfall generated runoff patterns. The spring and fall hydrographs are typically characterized by high flows in response to the annual snowmelt event in April-May and fall rains in October-November, while hydrographs during the summer and winter months are marked by mostly low to moderate flows (due to comparatively dry or frozen conditions). Surface water quality conditions are generally within relevant guideline values, with the exception of iron, cadmium, and phosphorus.

Project Case

During the construction and operation and maintenance stages, the Project could potentially affect surface water quality through short-term wastewater discharges, the transport and delivery of dust to nearby waterbodies, and from the wash-off from various construction areas that contain suspended sediment and contaminants to nearby waterbodies. However, given implementation of impact management measures, no net effect on the maintenance of surface water quality is anticipated.

All three corridors will potentially affect surface water quality and quantity during construction and/or operation and maintenance from short-term water taking, short-term water diversion, and changes in reach and cross-section hydraulics at waterbody crossings, changes in land cover (e.g., treed to bare ground or low-growing grasses and shrubs for the 40-m-wide transmission line alignment right-of-way and construction areas), and increased rates of erosion in disturbed and exposed areas with sediment transport and delivery to adjacent waterbodies. Wataynikaneyap will implement appropriate impact management measures to limit adverse effects to surface quantity and quality. The Project is expected to result in negligible net effects on surface quality and quantity.

Reasonably Foreseeable Developments Case

The surface water criteria was not carried forward for assessment of cumulative effects because no primary pathway of effects were predicted.
Groundwater

Base Case

Regionally, groundwater flow is generally southward from the higher elevation areas north of the Project study areas toward Lake Superior. Local groundwater flow parallels surface topography, particularly adjacent to major river valleys. Groundwater discharge may provide baseflow to streams and rivers.

Recharge of the shallow overburden and bedrock aquifers in the Project study areas is from precipitation and surface streams or rivers in areas where coarse sand and gravel is exposed at surface. Recharge also occurs through areas of fractured and jointed exposed bedrock.

A review of Ministry of the Environment and Climate Change water well records indicate that overburden (where present) ranged in thickness from 0.9 to 68 metres (m). Groundwater levels measured at the time of installation of these wells ranged from 0 metres below ground surface (mbgs) (i.e., water at surface) to 15.2 mbgs. A comparison of the static water level in the wells after drilling and the depth at which groundwater was encountered during drilling is indicative of confined aquifer conditions. The overburden material is a sandy silt till. The hydraulic conductivity of the overburden material ranges from a high of 1 x 10^{-3} metres per second (m/s) to a low of 1 x 10^{-7} m/s.

Within the Preliminary Proposed Corridor study area 41 wells were identified that were drilled between 1962 and 2013. There were 110 wells drilled between 1963 and 2016 located within the corridor alternatives study area. Ojibway Nation of Saugeen is serviced by individual water systems (i.e., wells) and Mishkeegogamang First Nation is serviced by a piped community water system, with a surface water source.

Project Case

The Project has the potential to result in changes to groundwater quality during the construction stage related to accidental spills. Wataynikaneyap will prepare and implement a Spill Prevention and Response Plan that will include procedures to decrease the risk of an accidental spill occurrence and timely clean-up if a spill were to occur. Wataynikaneyap will also implement a Waste Management Plan to effectively manage non-hazardous and hazardous liquid waste. With the implementation of these plans, accidental spills or discharges of liquid waste of sufficient magnitude to alter groundwater quality are not expected to occur.

Changes to groundwater quality may also be caused by disturbing shallow soils with potentially pre-existing contamination near the Pickle Lake transformer station. Such movement of potentially contaminated soils may lead to contamination of groundwater. Where possible, existing potentially contaminating properties in the Project footprint will be identified prior to construction. An environmental monitor will be onsite during construction to oversee implementation and effectiveness of impact management measures. With effective implementation of these impact management measures, the Project is not expected to result in negligible environmental changes.

Dewatering at foundation excavations and changes to groundwater recharge related to vegetation clearing and the hardening of surfaces (e.g., access roads and cleared right-of-way) have the potential to affect groundwater quantity. The pumping of the construction camp wells may also result in the lowering of the groundwater table. However, these potential effects are expected to be temporary and where required, Wataynikaneyap will implement appropriate impact management measures to limit adverse effects to groundwater quantity. As a result, the Project is expected to result in negligible net effects on groundwater quantity related to dewatering and activities that could affect groundwater recharge.
Blasting of holes in bedrock may be required to create level areas for new permanent access roads and transmission structures and for pouring concrete foundations. Drilling and blasting of holes in bedrock may create and extend fractures in the bedrock around each borehole. Overall, blasting will be minor, one-time localized events in the Project footprint, but may result in permanent effects to groundwater quantity within 4.5 to 9 m of a blast hole due to increased permeability from blasting, which may increase the groundwater table level. Further, ammonium nitrate explosives may be used to remove bedrock and existing soil for the placement of transmission structures. This type of explosive has the potential to leave nitrogen residual substances (e.g., ammonia nitrate) that can leach into groundwater. Wataynikaneyap will prepare and implement a Blast Management Plan that describes specific measures to be implemented if blasting is required, such as the 50 m setback from all private wells. The Project will not have a significant effect on the quality and quantity of groundwater for human and wildlife consumption and is anticipated to be suitable for continued use. The Project is not anticipated to have an effect on the overall functionality of groundwater resources as they currently exist. Therefore, the net effects of the Project on groundwater are determined to be not significant.

**Reasonably Foreseeable Developments Case**

Construction of the Project and changes to groundwater from past, present and reasonably foreseeable developments and activities, including pipelines, highway expansions and bridge and culvert replacements, may result in a cumulative effect to groundwater quantity. The contribution of the Project and other reasonably foreseeable developments to cumulative effects on groundwater quantity is not anticipated to have an effect on the overall functionality of groundwater resources as they currently exist. Cumulative effects on groundwater are predicted to be not significant.

**Air Quality**

**Base Case**

Sources of emissions in the Project study areas include vehicles on roadways, long-range transboundary air pollution such as industrial sources in the United States and small regional sources such as local industry. Overall, the monitoring data indicate that background air quality surrounding the Project is below the relevant provincial and federal ambient air quality guidelines, criteria and standards.

**Project Case**

All three corridors will generate criteria air contaminants and fugitive dust emissions from construction activities that can result in changes in ambient concentrations. The implementation of impact management measures, including an Air Quality Management Plan, are expected to limit adverse effects on air quality. Overall, negligible net effects for all three corridors are predicted on ambient concentrations of Suspended Particulate Matter (SPM), Particulate Matter less than 10 microns (PM\textsubscript{10}), Particulate Matter less than 2.5 microns (PM\textsubscript{2.5}), carbon monoxide (CO), nitrogen dioxide (NO\textsubscript{2}) and sulphur dioxide (SO\textsubscript{2}).

**Reasonably Foreseeable Developments Case**

Air quality was not carried forward for assessment of cumulative effects because negligible net effects were predicted.
Climate Change

**Base Case**

The primary sources of greenhouse gas emissions in Canada and Ontario are from anthropogenic sources that include the transportation sector and large industrial activities. In 2014, approximately 732 megatonnes of carbon-dioxide equivalent emissions were reported nationally. Ontario was accountable for 23% of these emissions.

**Project Case**

All three corridors will generate greenhouse gas emissions from construction activities that could potentially result in changes in federal and provincial annual greenhouse gas emissions. The implementation of impact management measures are expected to limit the generation of greenhouse gas emissions. Overall, all three corridors are expected to have a negligible net effect on the criteria's assessment endpoint based on the comparison between the estimated annual emission to both the federal and provincial greenhouse gas emissions.

While the Draft Environmental Assessment Report focuses on direct effects from the Phase 1 Project, it is important to note that greenhouse gas reductions will also occur as part of the Phase 2 portion of the overall project, which is enabled by Phase 1. Electrification of Northern communities (Phase 2) will avoid reliance on diesel generators. Diesel generators are much more carbon intensive than the electricity grid and require fuel delivery, which could be hindered by future projections of climate change impacting transportation routes (e.g., ice roads).

**Reasonably Foreseeable Developments Case**

Climate change was not carried forward for assessment of cumulative effects because negligible net effects were predicted.

Noise

**Base Case**

Baseline sound levels in the Project study areas are expected to be dominated by anthropogenic activities and sounds of nature. Baseline noise levels were determined for potential points of reception in the vicinity of the transformer station and Dinorwic and Ignace connection facilities. Near the Pickle Lake transformer station, baseline noise levels at potential points of reception are expected to be approximately 45 A-weighted decibels during the daytime period (07:00 to 19:00) and 40 A-weighted decibels during the evening/nighttime periods (19:00 to 07:00). Near the connection facilities, baseline noise levels at potential points of reception are expected to be approximately 45 A-weighted decibels during the daytime period (07:00 to 19:00) and 35 A-weighted decibels during the evening/nighttime periods (19:00 to 07:00). These levels are in accordance with the Ministry of the Environment and Climate Change Noise Pollution Control Guideline 300.

**Project Case**

Negligible net effects were predicted for changes to noise indicators for all three corridors. As a result, there would be no significant effects to noise relative to existing noise levels. With the implementation of the impact management measures, negligible net effects are predicted which would not be significant.
During construction, noise emissions from construction activities could increase existing noise levels at potential points of reception during the daytime period. There is no potential for a change in perceived noise levels during the nighttime period as Project construction will typically occur during one 10-hour shift per day, generally within the daytime period (i.e., 07:00 to 19:00). Existing noise levels at given points of reception can be expected to increase, on occasion, due to construction activities when occurring nearby, but construction noise will be temporary in nature and limited in durations.

**Reasonably Foreseeable Developments Case**

The reasonably foreseeable developments identified are not expected to coincide with the temporal and spatial boundaries of the noise assessment. No cumulative effects were predicted for noise.

**Biological Environment Baseline and Effects Assessment**

**Vegetation and Wetlands**

**Upland Ecosystems**

**Base Case**

Upland ecosystems provide a diversity of ecological structure and function for plants and wildlife occupying the landscape. The majority of the landscape across the Project study areas for the Preliminary Proposed Corridor and corridor alternatives is composed of coniferous, hardwood and mixed-wood forests, and smaller amounts of scattered bedrock. The age of forests across the Project study areas are variable. Common upland ecosites are expected to have the capacity to adapt and be resilient to existing natural and human-related disturbances and associated variations in availability. Less commonly found upland ecosystems, such as the Bedrock land cover class in the Corridor Alternative Through Mishkeegogamang are likely less resilient and more susceptible to change.

No species listed as a noxious weeds in Ontario were detected during baseline surveys of the Preliminary Proposed Corridor. However, baseline surveys identified two non-native weed species. Hound’s-tongue was observed outside the Project footprint within a Forest-dense mixed land cover class. Mouse-ear hawkweed was observed outside the Project footprint within a cutblock. No federally-listed plant species or species tracked provincially were observed during the baseline plant community surveys in the Preliminary Proposed Corridor.

**Project Case**

All three corridors are predicted to contribute to small negative changes in upland ecosystem availability, distribution, and composition. These changes should have no to little influence on ecological structure and function; approximately 98% of upland ecosystems present in the Base Case are predicted to remain in the Project Case within the Project study areas. There is a predicted loss of 1,277 hectares (ha), 1,162 ha, and 1,135 ha of upland ecosystems for the Preliminary Proposed Corridor and corridor alternatives around and through Mishkeegogamang, respectively. There is a predicted loss of 1.0 ha to upland Critical Landform/Vegetation Associations for the Preliminary Proposed Corridor and a predicted loss of 23.7 ha for each corridor alternative.

Rare vegetation communities were also considered in the upland ecosystem assessment. The rare bur oak vegetation community can be found as part of the NW30 ecosite and is included in upland ecosystems. This ecosite was not identified in the study areas for the corridor alternatives. There is no loss of the NW30 ecosite within the Preliminary Proposed Corridor study area.
Reasonably Foreseeable Developments Case

In the Reasonably Foreseeable Development Case, the Preliminary Proposed Corridor, corridor alternatives, and other reasonably foreseeable developments would contribute to adverse changes in upland ecosystem availability, distribution, and condition; however, these changes are predicted to be within the resilience limits and adaptive capacity of existing upland ecosystems. Relative to the Base Case, most uplands remain abundant, intact and well distributed across the study areas in the Reasonably Foreseeable Development Case. The contribution of the Preliminary Proposed Corridor, corridor alternatives, and reasonably foreseeable developments to cumulative effects on upland ecosystems in the study areas is not expected to change the self-sustaining and ecologically effective status of this criterion. Consequently, cumulative effects on upland ecosystems in the Reasonably Foreseeable Development Case are predicted to be not significant.

Riparian Ecosystems

Base Case

Riparian ecosystems are distributed throughout the study areas for the Preliminary Proposed Corridor and corridor alternatives, and are associated with streams, rivers and lakeshores. Riparian habitat in the region has been and continues to be altered by human activities such as vegetation clearing. Through much of the 1900s, forestry practices would have included clearing trees from riparian areas. Approximately 5 to 6% of the study areas of the Preliminary Proposed Corridor and corridor alternatives are comprised of riparian habitat. The riparian habitats in the Project study areas of the Preliminary Proposed Corridor and corridor alternatives have maintained overall function in terms of ability to support the variety of wildlife that use them for foraging, nesting, and dispersal. No noxious species were detected in riparian habitat along the Preliminary Proposed Corridor during baseline field surveys.

Project Case

All three corridors are predicted to contribute to small negative changes in riparian ecosystem availability, distribution, and composition. With effective implementation of impact management measures, minimal changes in the remaining riparian habitat condition are predicted. The Preliminary Proposed Corridor and corridor alternatives are not predicted to change the self-sustaining and ecologically effective status of riparian ecosystems identified for the Base Case. There is a predicted loss of 66 ha, 56 ha, and 53 ha of riparian ecosystems for the Preliminary Proposed Corridor and corridor alternatives around and through Mishkeegogamang respectively.

Reasonably Foreseeable Developments Case

The combined effects in the Reasonably Foreseeable Development Case would reduce riparian habitat availability by 1.1% to 3.8% in the Project study areas relative to the Base Case. Connectivity and condition of riparian habitat would likewise decline in the Reasonably Foreseeable Development Case relative to the Base Case due to the cumulative effects of the Project and reasonably foreseeable developments. Overall, changes in riparian habitat indicators from the cumulative effects of development are not predicted to exceed the limits of resilience and adaptability of riparian habitat in the Project study areas. Relative to the Base Case, riparian habitat remains abundant, intact and well distributed across the study areas in the Reasonably Foreseeable Development Case. Approximately 91.6% to 95.2% of habitat adjacent to watercourses and waterbodies in the Project study areas remains naturally vegetated in the Reasonably Foreseeable Development Case, which is above the resource management criterion of 75% naturally vegetated stream length recommended by Environment Canada to prevent degradation of these ecosystems. The weight of evidence indicates that cumulative effects from the Project,
and past, present, and reasonably foreseeable developments on riparian ecosystems in the RSA are predicted to be not significant in the Reasonably Foreseeable Development Case.

**Wetlands**

**Base Case**

Wetlands remain abundant across all of the Project study areas for the Preliminary Proposed Corridor and corridor alternatives despite changes from historical disturbances. Wetlands were mapped as either bogs or fens. It is likely that mineral wetlands also exist in the Project study areas. Approximately 4 to 5% of the Project study areas of the Preliminary Proposed Corridor and corridor alternatives are comprised of wetland habitat.

Resilience in wetlands is a function of soil type, as mineral-based wetlands can be reclaimed and contribute to reversing adverse effects, while there is less confidence in reclaiming peat-type wetlands when soils have been disturbed. Most wetlands are expected to have the capacity to adapt and be resilient to existing natural and human-related disturbances and associated variations in availability. However, some specific wetland types (i.e., the Fen – open land cover class) are uncommon on the landscape and would be likely less resilient to adverse changes in availability.

No species listed as a noxious weeds in Ontario were detected during baseline surveys within the Preliminary Proposed Corridor study area. No plant species listed federally or provincially were observed during the baseline plant community surveys. One rare plant species has been reported as an Element Occurrence (i.e., areas of land or water on or in which a species or plant community is or was present) within the Preliminary Proposed Corridor study area. The species documented was slender bulrush, a provincially vulnerable (S3) plant.

**Project Case**

All three corridors are predicted to cause small losses to wetlands. Changes are expected to be within the existing resilience limits and adaptive capacity of wetland ecosystems. For example, the incremental loss to the available wetland ecosystems for the Preliminary Proposed Corridor and corridor alternatives is calculated to be 56 ha, 43 ha, and 41 ha, respectively. These changes should have little to no influence on ecological structure and function; approximately 98% of wetland ecosystems present in the Base Case are predicted to remain in the Project Case within the study areas for the Preliminary Proposed Corridor and corridor alternatives. Wetlands may withstand large losses (i.e., up to 60% of historical wetlands) before their functional role on the landscape is compromised. In addition, the Preliminary Proposed Corridor and corridor alternatives have been designed to cause little to no disturbance to the least common land cover class (i.e., Fen-open). There is a predicted loss of 0.9 ha to wetland Critical Landform/Vegetation Associations for the Preliminary Proposed Corridor and a predicted loss of 5.5 ha for each corridor alternative.

The vegetation and wetlands assessment also considered effects to rare vegetation communities. For the Preliminary Proposed Corridor there is a predicted loss of 111 ha to the NW36 ecosite. For the Corridor Alternative Around Mishkeegogamang there is a predicted loss of 95 ha to the NW36 ecosite. For the Corridor Alternative Through Mishkeegogamang there is a predicted loss of 82 ha to NW36 ecosite.

**Reasonably Foreseeable Developments Case**

Overall, changes to ecosystem availability, distribution and composition from the Project and reasonably foreseeable developments are predicted to be within the resilience limits and adaptive capacity of wetland ecosystems. Despite changes in wetland condition during the Base Case, existing wetlands remain well-connected.
to support a diversity of plant and wildlife species in the region, and this is not expected to change in the Reasonably Foreseeable Development Case. The reduction in wetland ecosystem condition in the Reasonably Foreseeable Development Case relative to the Base Case is not predicted to greatly alter the ecological function of wetlands on the landscape because most (94% to 96%) wetlands would remain intact and well distributed across the study areas of the Preliminary Proposed Corridor and corridor alternatives. The combined evidence regarding wetland ecosystem availability, distribution, and condition in the study areas indicates that this ecosystem would continue to be self-sustaining and ecologically effective in the Reasonably Foreseeable Development Case. Consequently, cumulative effects on wetland ecosystems in the Reasonably Foreseeable Development Case are predicted to be not significant.

**Fish and Fish Habitat**

**Base Case**

The Project study areas contain many waterbodies that provide fish habitat and have potential to support many different fish species. The larger waterbodies provide fish habitat year-round, including spawning, rearing, feeding, and overwintering habitat. The smaller waterbodies may not provide overwintering habitat, as oxygen levels in shallow lakes and wetlands can drop to hypoxic conditions and the watercourses may freeze to bottom. Smaller waterbodies can be suitable habitat for spawning, rearing, and feeding for portions of the year, typically in early spring and after the spring freshet. Spring and fall spawning habitat is available for a variety of species.

Waterbodies in the Project study areas are known to support 53 fish species, including the four criteria species (Brook Trout, Lake Trout, Walleye, and Lake Sturgeon). The Project study areas contain a diverse fishery consisting of many species important for commercial, recreational, and Aboriginal fishing, including forage fish, sport fish, and species of conservation concern. This species list is typical of cold and cool water thermal regimes in Ontario. Species that are targeted by anglers in the area (e.g., Brook Trout, Lake Trout, Northern Pike, Walleye, Yellow Perch, and Lake Sturgeon) are part of a commercial, recreational, or Aboriginal fishery.

Overall, the waterbodies in the Project footprints are likely to be productive from a fisheries perspective given the documented fish presence and distribution of fish in the Project study areas. It is likely that the majority of the waterbodies have fish present even if there is no documented fish presence. The most common fish species (i.e., recorded in the most waterbodies, and in upstream and downstream waterbodies) were Walleye, Northern Pike, Yellow Perch, White Sucker, and Mimic Shiner.

One federally and/or provincially protected species of conservation concern was identified with potential to occur in the Project study areas. Based on known habitat requirements and geographic distributions, Lake Sturgeon from the Southwest Hudson Bay and Nelson River populations have a reasonable potential to occur in the Project study areas. Lake Sturgeon in the Nelson River Basin are listed as “Endangered” federally and as “Threatened” provincially. Lake Sturgeon in the Southwest Hudson Bay Basin are listed as “Special Concern” federally and provincially.

**Project Case**

The Project has the potential to result in the injury or mortality of fish from instream construction and the use of explosives and from the transport and delivery of dust to nearby waterbodies, which could affect fish habitat quantity and quality. However, given the implementation of impact management measures, no net effects related to the injury or mortality of fish or the deposition of dust are anticipated.
All three corridors have the potential to affect fish and fish habitat related to Brook Trout, Lake Trout, and Walleye. Changes to fish and fish habitat for these species relate to physical alteration of waterbodies, release of sediment during road construction at waterbody crossings and from land disturbance, placement of waterbody crossing structures, changes to hydrology or groundwater and changes to public access to recreational angling areas. Wataynikaneyap will implement appropriate impact management measures to limit adverse effects to fish and fish habitat. In general, the Project is expected to result in negligible net effects on fish and fish habitat related to the potential effects listed above. As a result, there would be no significant effects on the maintenance of self-sustaining and ecologically effective populations of the criteria species (Brook Trout, Lake Trout, Walleye, and Lake Sturgeon).

Reasonably Foreseeable Developments Case

Fish and fish habitat was not carried forward for assessment of cumulative effects because negligible net effects were predicted.

Wildlife

Forest-Dwelling Woodland Caribou

Base Case

Current availability of habitat likely represents a decline in suitable habitat relative to what was historically available for this species, as development activities have influenced the amount and quality of habitat since the late 1800s. The Preliminary Proposed Corridor crosses two caribou ranges (Churchill Range and Kinloch Range) while the corridor alternative cross three caribou ranges (Churchill Range, Brightsand Range and Kinloch Range).

Approximately 44.1% of the Churchill Range is currently disturbed and these disturbances are predominantly anthropogenic (39.2% of the range). Despite the decline in range connectivity over time, nursery and winter use areas appear to be well connected in the northwest, northeast and central portions of the range. At Base Case, the Churchill Range has 9,771 km of linear features representing a density of approximately 0.46 km/km². Geographic Positioning System collar data suggests relatively small home range sizes and limited seasonal movement between summer and winter areas, particularly in between the Lac Seul Forest and the northwest and northcentral sections of the Caribou Forest. There is evidence showing regional connectivity between the Churchill Range and other neighbouring caribou ranges. Caribou survival and reproduction has presumably been negatively affected over time as a result of cumulative landscape change in the Churchill Range. Based on available evidence, caribou are expected to have exceeded their limits of resilience and adaptive capacity and are not considered self-sustaining at Base Case. The population likely remains ecologically effective given documented connectivity and movement across neighbouring ranges but given known constraints to habitat connectivity and movement, their ecological effectiveness is likely compromised at Base Case.

The Brightsand Range is currently approximately 45.4% disturbed at Base Case and these disturbances are predominantly anthropogenic (36.5% of the range). At Base Case, the Brightsand Range has 12,191 km of linear features representing a density of approximately 0.55 km/km². Caribou habitat remains well connected in the northwestern portion of the range, particularly within Wabakimi Provincial Park, which supports the highest concentrations of caribou in the Brightsand Range. Evidence from collared caribou shows regional movement across the northern range boundary (i.e., to the Kinloch Range) and across the eastern and western boundaries (i.e., to the Churchill and Nipigon Range). As in the Churchill Range, caribou survival and reproduction in the
Brightsand Range has presumably been negatively affected over time as a result of cumulative landscape change. Based on available evidence, caribou are expected to have exceeded their limits of resilience and adaptive capacity and are not considered self-sustaining at Base Case. The population likely remains ecologically effective given documented connectivity and movement across neighbouring ranges but given known constraints to habitat connectivity and movement, their ecological effectiveness is likely compromised at Base Case.

The Kinloch Range is 18.9% disturbed at Base Case and disturbances are predominantly natural (14.2% of the range). At Base Case, the Kinloch Range has 922 km of linear features representing a density of approximately 0.03 km/km², which is considerably lower than values calculated for the Churchill and Brightsand Ranges. Home range sizes of caribou in the Kinloch Range are considered smaller than most other caribou ranges in the Far North region, which suggests restricted movement patterns relative to other ranges. Caribou survival and reproduction in the Kinloch Range has presumably declined over time as a result of cumulative landscape change, although the extent of this change is expected to be less important those observed in the Churchill and Brightsand Ranges owing to a lower portion of disturbance and limited human settlements. Caribou are likely to be within their limits of resilience and adaptive capacity at Base Case, but due to the uncertainty around range conditions it is uncertain if Kinloch caribou are self-sustaining at Base Case. The population likely remains ecologically effective given documented connectivity and movement across neighbouring ranges.

**Project Case**

Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change caribou habitat availability. Changes to high-use areas, such as nursery areas and winter use areas, can have disproportionally large effects to caribou because these habitats support key functions linked to survival and reproduction. Sensory disturbances associated with site preparation, construction, operation and maintenance activities can also change the amount and quality of caribou habitat if areas in proximity to the Preliminary Proposed Corridor or corridor alternatives are avoided by caribou. Effects to high-use areas will be minimized by applying timing restrictions for clearing and construction activities (i.e., between May 1 and September 15 for nursery areas and between December 1 and March 31 for winter use areas). Use of linear corridors and converted habitat (i.e., younger, more productive forest) by moose and wolves could lead to a reduction in caribou survival and reproduction through increased predation pressure.

Within the Churchill and Brightsand caribou ranges, the Project is expected to result in small incremental changes in caribou habitat availability, habitat distribution, and survival and reproduction. These changes are not predicted to change the abundance and distribution of caribou in the Project study areas, relative to the Base Case. The caribou populations in both ranges are not considered self-sustaining at Base Case, suggesting that the population’s resilience and adaptability limits have already been exceeded. The incremental changes resulting from the Preliminary Proposed Corridor or the two corridor alternatives will contribute to a small reduction in range condition which may further impede the ability to recover the Churchill and Brightsand caribou populations to a self-sustaining status. Caribou in the Churchill Range and Brightsand Range continue to be considered not self-sustaining in the Project Case. Ecological effectiveness continues to be compromised in the Project Case, but is not expected to be lost. Effects from the Project are therefore considered significant.

Within the Kinloch caribou range, the small incremental changes in caribou habitat availability, habitat distribution, and survival and reproduction from the Project are not predicted to change the abundance and distribution of caribou in the Project study areas, relative to the Base Case. The changes are expected to be within the
adaptable and resilience limits of the Kinloch caribou population. The incremental changes resulting from the Preliminary Proposed Corridor or the two corridor alternatives will contribute to a small reduction in range condition; however, the proportion of disturbance within the Kinloch range will remain well below the 35% threshold identified by Environment Canada. Due to uncertainty around range conditions, the Ministry of Natural Resources and Forestry determined that it is uncertain if Kinloch caribou are self-sustaining at Base Case. The self-sustaining status of caribou in the Kinloch Range remains uncertain in the Project Case, for the Preliminary Proposed Corridor or for the two corridor alternatives. The population is predicted to remain ecologically effective given that limited effects on habitat connectivity and caribou movement are expected. Effects from the Project are therefore considered not significant.

Reasonably Foreseeable Developments Case

Within the Churchill and Brightsand caribou ranges, the combined effects from predicted changes in caribou habitat availability, habitat distribution, and survival and reproduction from reasonably foreseeable developments are predicted to change the abundance and distribution of caribou in the Project study areas, relative to the Base Case. These caribou populations are not considered self-sustaining at Base Case, suggesting that the population’s resilience and adaptability limits have already been exceeded. The changes resulting from the reasonably foreseeable developments will contribute to a deterioration in range condition which will further impede the ability to recover the Churchill and Brightsand caribou populations to a self-sustaining status. Caribou in these two ranges continue to be considered not self-sustaining in the Reasonably Foreseeable Development Case. Ecological effectiveness continues to be compromised in the Reasonably Foreseeable Development Case, but is not expected to be completely lost. Effects from reasonably foreseeable developments are considered significant.

Within the Kinloch caribou range, the combined effects from predicted changes in caribou habitat availability, habitat distribution, and survival and reproduction from reasonably foreseeable developments are not predicted to change the abundance and distribution of caribou in the Project study areas, relative to the Base Case. The changes are expected to be within the adaptability and resilience limits of the Kinloch caribou population. The incremental changes resulting from the RFD projects will contribute to a reduction in range condition; however, the proportion of disturbance within the Kinloch range is expected to remain below the 35% threshold identified by Environment Canada. The self-sustaining status of caribou in the Kinloch Range remains uncertain in the Reasonably Foreseeable Development Case. The population is predicted to remain ecologically effective given that limited effects on habitat connectivity and caribou movement are expected. Effects from reasonably foreseeable developments are therefore considered not significant.

Moose
Base Case

Historically, moose have been distributed across forested regions of Canada; however, moose have recently expanded their range to include prairie and tundra ecosystems. Although considered a generalist species, moose have been shown to prefer deciduous aspen, shrubland, and wetlands interspersed with trees and shrubs. Overall, moose are expected to have the capacity to adapt and be resilient to existing natural and human-related disturbances and associated variations in habitat availability and distribution in the Project study areas. There is a large amount of moderate and high suitability moose habitat in the Project study areas, which is well distributed across the landscape. Moose densities in Wildlife Management Units overlapping the Project study areas are within or above the Ministry of Natural Resources and Forestry’s desired ecological density range. Moose display
life history traits (e.g., large home ranges, high reproductive rates, ability to eat many types of plants) that provide flexibility to adapt to changes from human development. Therefore it is expected that changes in survival and reproduction during Base Case are within the resilience and adaptability limits for this criterion.

**Project Case**

The Preliminary Proposed Corridor is predicted to result in a direct loss of 1,290 ha of moderate to high suitability moose habitat. The Corridor Alternative Around Mishkeegogamang is predicted to result in a direct loss of 1,054 ha of moderate to high suitability moose habitat. The Corridor Alternative Through Mishkeegogamang is predicted to result in a direct loss of 1,042 ha of moderate to high suitability moose habitat. Moose are considered to be resilient to changes in habitat distribution because they are highly mobile and can adapt to fragmented landscapes. Therefore, the small incremental changes in moose habitat availability, distribution, and survival and reproduction from the preliminary proposed or corridor alternatives, relative to the Base Case, are predicted to remain within the resilience and adaptability limits of this species. Consequently, moose populations in the Project study areas are anticipated to remain self-sustaining and ecologically effective at Project Case. Incremental and combined effects from the Project and previous and existing developments are predicted to be not significant.

**Reasonably Foreseeable Developments Case**

Moose display life history traits (e.g., high reproductive and dispersal rates, ability to eat many types of plants) that provide flexibility to adapt to different ecozones and rates of development across North America. The most recent surveys of moose populations by Ministry of Natural Resources and Forestry indicate that Wildlife Management Units that intersect the preliminary proposed and corridor alternatives have moose densities within desired ecological goals. The combined evidence concerning the cumulative changes to moose habitat availability, distribution, and survival and reproduction in the Project study areas from Base Case to Reasonably Foreseeable Development Case indicates that moose populations would continue to be self-sustaining in the moose regional study area, although possibly at a lower abundance. Reductions of habitat availability, distribution, and survival and reproduction are not expected to affect the ecological effectiveness of moose in or beyond the Project study areas. Consequently, effects on moose in the Reasonably Foreseeable Development Case are predicted to be not significant.

**Wolverine**

**Base Case**

Wolverine is a generalist species that uses a wide variety of forested habitat types. The most important factor in habitat selection is likely prey abundance. Overall, quality wolverine habitat is abundant and well distributed in the Project study areas. Changes in habitat availability and distribution from natural and human-related disturbances during the Base Case are likely within the resilience and adaptive capacity limits for wolverine in the Project study areas. The species is highly mobile and can use many different habitat types.

**Project Case**

The Preliminary Proposed Corridor is predicted to result in a direct loss of 13,750 ha of high suitability wolverine habitat while the corridor alternatives around and through Mishkeegogamang are predicted to result in a direct loss of 7,713 ha and 4,454 ha of high suitability wolverine habitat, respectively. The small incremental changes in wolverine habitat availability, distribution, and survival and reproduction from the Project Case, relative to the Base Case, is predicted to remain within the resilience and adaptability limits of this species. Consequently,
wolverine populations that overlap the Project study areas are anticipated to remain self-sustaining and ecologically effective at Project Case. Incremental and cumulative effects from the preliminary proposed or corridor alternatives and previous and existing developments are predicted to be not significant.

Reasonably Foreseeable Developments Case

The combined evidence concerning the cumulative effects on wolverine habitat availability, distribution, and survival and reproduction in the Project study areas from Base Case to Reasonably Foreseeable Development Case indicates that wolverine populations would continue to be self-sustaining, although possibly at a lower abundance. Reductions of habitat availability, distribution, and survival and reproduction in the Reasonably Foreseeable Development Case are not expected to affect the ecological effectiveness of wolverine in the Project study areas. Consequently, effects on wolverine in the Reasonably Foreseeable Development Case are predicted to be not significant.

Little Brown Myotis

Base Case

Little brown myotis are not habitat specialists and have been documented in a wide variety of coniferous and deciduous forest types. Overall, the results of the field studies and general habitat model suggest a clustered distribution of winter habitat and broader distribution of summer habitat in the Project study areas. Wildfire likely limited the amount of suitable summer in the Project study areas, historically, and maternity habitat may have increased in coverage in recent years due to fire suppression activities. Hibernacula are likely a limiting factor for little brown myotis but the number of hibernacula are considered to be within resilience limits for this species as there may currently be more hibernacula present in the Project study areas than under historical, natural conditions, due to abandoned underground mines. Existing disturbances in the Project study areas do not function as dispersal barriers for this species in the Base Case because bats are highly mobile. As such, changes to habitat distribution in the Base Case have not exceeded the resilience or adaptability limits of the little brown myotis.

Little brown myotis are long lived but only give birth to one pup per, making their populations sensitive to increases in adult mortality and slow to recover when the population size is small. Little brown myotis is listed as endangered provincially and federally due to dramatic population declines resulting from a devastating fungal disease called white nose syndrome. It is anticipated that the entire Canadian population of little brown myotis will be impacted by the disease within 11 to 22 years, or possibly sooner. The little brown myotis is predicted to be functionally extirpated (i.e., less than 1% of existing population remaining) in Canada and the United States within 16 years due to white nose syndrome. Although white nose syndrome has not yet been reported in the Project study areas, the disease was confirmed in Atikokan in 2015. Atikokan is approximately 75 km southeast of Ignace and 115 km southeast of Dinorwic. The presence of white nose syndrome in the Project study areas is uncertain because there is limited information related to the hibernacula in northern Ontario. Regardless, there is an imminent threat to little brown myotis populations that overlap the Project study areas from the disease. Therefore, changes to little brown myotis abundance in the Base Case may have exceeded the resilience and adaptability limits of this criterion due to the mortality associated with the disease. The Base Case is already assumed to be significantly affected.

Project Case

Populations of little brown myotis that overlap with the Project study areas are highly sensitive to changes in survival and reproduction because white nose syndrome has resulted in dramatic declines of this species across
the eastern portions of its range and likely the Project study areas. Because of its currently declining population, little brown myotis is highly vulnerable to additional threats including changes in habitat availability, distribution or other factors affecting the survival and reproduction of the remaining individuals. Nevertheless, habitat is not a limiting factor in the Base Case and the species itself is inherently resilient to habitat changes because it is highly mobile and well adapted to human disturbance. The species tends to be tolerant of fragmented forested habitat and uses linear features for movement and foraging.

The Preliminary Proposed Corridor is predicted to result in the direct loss of 112 ha of potential maternity roost habitat. The Corridor Alternative Around Mishkeegogamang is predicted to result in the direct loss of 134 ha of potential maternity roost habitat. The Corridor Alternative Through Mishkeegogamang is predicted to result in 124 ha of direct loss of maternity roost habitat. Incremental changes due to the preliminary proposed or corridor alternatives are predicted to not adversely affect little brown myotis populations that overlap with the Project study areas. All three corridors are likely to have similar effects on bat movement and population connectivity. However, the Preliminary Proposed Corridor is predicted to have the lowest magnitude effect on little brown myotis habitat availability as the route crosses through the least amount of potential maternity and hibernacula habitat.

Reasonably Foreseeable Developments Case

Incremental changes due to the preliminary proposed or corridor alternatives are predicted to not adversely affect little brown myotis populations that overlap with the Project study areas; however, these populations are expected to continue to decline in the Reasonably Foreseeable Development Case due to white nose syndrome. It is expected that reasonably foreseeable developments, including the preliminary proposed or corridor alternatives, will be required to implement impact management measures that will limit cumulative effects on this species. Nevertheless, little brown myotis populations that overlap the Project study areas continue to be considered as not likely self-sustaining and not ecologically effective in the Reasonably Foreseeable Development Case; combined effects in the Reasonably Foreseeable Development Case are predicted to be significant, even though the preliminary proposed or corridor alternatives would contribute no to little cumulative effects on little brown myotis, after impact management measures.

Horned Grebe

Base Case

The Preliminary Proposed Corridor or corridor alternatives are not expected to change the availability or distribution of habitat for horned grebe as the corridors will not adversely affect wetlands or waterbodies. No horned grebe or other listed waterbird species were observed during baseline surveys in 2016.

Project Case

The Preliminary Proposed Corridor or corridor alternatives are not expected to change the availability or distribution of habitat for horned grebe as the corridors will not adversely affect wetlands or waterbodies. Therefore, the Project is expected to result in negligible net effects on horned grebe.

Reasonably Foreseeable Developments Case

Horned grebe was not carried forward for assessment of cumulative effects because negligible net effects were predicted.
Bald Eagle

Base Case

Bald eagles are found in association with aquatic habitats (e.g., coastal areas, rivers, lakes and reservoirs) with forested shorelines or cliffs throughout North America. Bald eagles nest in mature or old growth forest with some edge, in the largest available trees, typically 20 to 60 m in height. Suitable habitat along the Preliminary Proposed Corridor study area is more patchily distributed with larger patches of habitat near Pickle Lake and Bamaji Lake. The largest amount of suitable habitat for bald eagle in the corridor alternative around and through Mishkeegogamang study areas was mapped between Fitchie Lake and Annimwash Lake. Overall, habitat is well distributed and connected in the Project study areas. Existing disturbances in the Project study areas do not likely function as a dispersal barrier for this species in the Base Case. Bald eagle populations that overlap with the Project study areas are considered to be within the resilience and adaptability limits of this criterion. Bald eagle are long lived and slow to mature, capable of breeding at five years, but often not until they reach six or seven years of age. The Project study areas likely overlap with several distinct but interbreeding bald eagle populations. Based on the population status and trends derived for the Project study areas, bald eagle populations that overlap with the Project study areas are likely smaller relative to those historically present, but Ontario populations are experiencing positive growth rates in the Base Case. Therefore, changes to survival and reproduction are predicted to be within the resilience or adaptability limits of this criterion at Base Case.

Project Case

The Preliminary Proposed Corridor is predicted to result in a direct loss of 252 ha of bald eagle habitat. The Corridor Alternative Around Mishkeegogamang is predicted to result in a direct loss of 354 ha of bald eagle habitat. The Corridor Alternative Through Mishkeegogamang is predicted to result in a direct loss of 342 ha of bald eagle habitat. Overall, the preliminary proposed and corridor alternatives are predicted to have minimal negative changes to habitat availability and distribution, and survival and reproduction of bald eagle populations overlapping the Project study areas. However, the incremental changes at Project Case are expected to be well within the resilience and adaptability limits of this criterion for all corridors. Consequently, bald eagle are expected to remain self-sustaining and ecologically in the Project Case relative to the Base Case. Effects from the Preliminary Proposed Corridor or corridor alternatives are predicted to be not significant.

Reasonably Foreseeable Developments Case

The preliminary proposed or corridor alternatives, highway expansion, new transmission lines, pipeline construction, mining, and forestry have the potential to reduce bald eagle habitat availability and distribution in the Project study areas through direct habitat loss and avoidance due to sensory disturbance. Some individuals may adapt or habituate to sensory disturbance. Changes in habitat distribution in the Reasonably Foreseeable Development Case will have effects on movement and habitat use, but bald eagle populations that overlap with the Project study areas should remain well connected because this species is highly mobile. Overall, the small changes in habitat availability and distribution (and associated predicted reduction in abundance) should have little detectable influence on the abundance of bald eagle that overlap the Project study areas. Cumulative effects from past and present developments, the preliminary proposed or corridor alternatives and reasonably foreseeable developments on bald eagles in the Reasonably Foreseeable Development Case are predicted to be not significant.
Canada Warbler

Base Case

Canada warbler breeds in forested areas in Canada and the parts of the United States and overwinter in South America. Overall, habitat is well distributed and connected across the Project study areas. Habitat fragmentation from mineral exploration and other linear disturbances in the Project study areas do not likely function as dispersal barriers for this species in the Base Case and habitat conditions at Base Case are predicted to be well within the resilience and adaptive capacity limits for this criterion.

Approximately 50% of the Canadian population may reside in Ontario. However, Canada warbler was not observed during breeding bird surveys for the Project in 2012. This is consistent with other public information that is available indicating that although Canada warblers breed from the Mixedwood Plains north to the Hudson Plains, the highest densities of this species occur in the Southern Shield.

Project Case

The Preliminary Proposed Corridor is predicted to result in a direct loss of 637 ha of moderate to high suitability Canada warbler habitat. The Corridor Alternative Around Mishkeegogamang is predicted to result in a direct loss of 608 ha of moderate to high suitability Canada warbler habitat. The Corridor Alternative Through Mishkeegogamang is predicted to result in a direct loss of 596 ha of moderate to high suitability Canada warbler habitat. Effective implementation of impact management measures, such as progressive reclamation of temporary disturbance areas and selective clearing of incompatible vegetation and retention of vegetation will reduce the magnitude of habitat loss from the preliminary proposed or corridor alternatives. The reduction in available habitat would be experienced continuously during construction, but some of this disturbance would be temporary and functional early successional habitat would become available in six to ten years following completion of construction. Additional suitable habitat in the Project study areas may be avoided by Canada warbler due to sensory disturbance during construction. Sensory disturbance during construction is considered to be continuous, but it would be isolated and of short duration across the Project study areas due to construction being completed sequentially down the line. Habitat degradation from noise, dust and other sensory disturbances would be reduced in the operation and maintenance stages because maintenance activities will be infrequent and of short duration. Overall, incremental and cumulative effects from the preliminary proposed or corridor alternatives and previous and existing developments on Canada warbler populations that overlap the Project study areas are predicted to be not significant.

Reasonably Foreseeable Developments Case

Although habitat loss is considered the main threat to Canada warblers, habitat is not limited in the Project study areas at Base Case or the Reasonably Foreseeable Development Case. Overall, changes in habitat availability and distribution are expected to be within the resilience and adaptive capacity limits of Canada warbler populations overlapping the Project study areas. Consequently, cumulative effects on Canada warbler in the Reasonably Foreseeable Development Case are predicted to be not significant.
**Eastern Whip-poor-will**

**Base Case**

In Ontario, whip-poor-will are found from the Manitoba border, east to Kenora, with a northern limit roughly following the northern shore of Lake Superior, south to the United States border, and lower Great Lakes. The main disturbances in the Project study areas at Base Case include forestry, fire and fire suppression activities, and linear development. Disturbances have likely resulted in positive changes to whip-poor-will habitat as road ROWs and utility corridors can create habitat for this species.

Habitat that is currently present in the Project study areas is likely an increase in suitable habitat relative to what was historically available for this species because post-harvest areas of 0 to 15 years can provide suitable habitat for whip-poor-will and forest management policies have favoured the development of smaller clear cuts, which may increase whip-poor-will habitat. Suitable habitat occurs in numerous discrete patches that are well distributed throughout the Project study areas for the three corridors. Larger, more contiguous habitat patches are located north of Lake St. Joseph in each of the Project study areas. Overall, whip-poor-will habitat availability remains high in the Project study areas at Base Case and is not considered a limiting factor for this species. The positive and negative changes to the amount of suitable habitat available in the Base Case are predicted to be within the adaptability and resilience limits of the whip-poor-will populations that may overlap with the Project study areas.

**Project Case**

Eastern whip-poor-wills were likely never abundant in the Project study areas due to a historical small abundance of naturally available suitable habitat. Eastern whip-poor-will were found infrequently in several isolated locations near Red Lake during the second Ontario Breeding Bird Atlas survey from 2001 to 2005.

The Preliminary Proposed Corridor is predicted to result in a direct loss of 372 ha of Eastern whip-poor-will habitat, while the corridor alternatives around and through Mishkeegogamang are predicted to result in a direct loss of 244 ha and 250 ha of Eastern whip-poor-will habitat respectively. With effective implementation of impact management measures, such as spanning areas with compatible vegetation (e.g., bedrock outcrops) the incremental changes due to the preliminary proposed or corridor alternatives are not predicted to adversely influence whip-poor-wills that occupy the Project study areas because habitat is not a limiting factor. The generation of early disturbance (succession) habitat may improve habitat conditions for this species. Consequently, effects from the preliminary proposed or corridor alternatives in the Project Case (which includes combined effects from previous and existing developments) on eastern whip-poor-will are predicted to be not significant.

**Reasonably Foreseeable Developments Case**

Overall, the weight of evidence from the analysis of the primary pathways predicts that changes to whip-poor-will habitat availability, habitat distribution, and survival and reproduction are within the resilience and adaptability limits of the species. Populations that overlap the Project study areas remain self-sustaining and ecologically effective in the Cumulative Effects Case. Therefore, cumulative effects from the Project and other past, present and reasonably foreseeable developments on whip-poor-will in the Cumulative Effects Case are predicted to be not significant.

June 2017
Project No. 1535751
Common Nighthawk

Base Case

Common nighthawk are associated with a variety of open or semi-open habitats, including forest clearings, burned areas, grassy meadows, rocky outcrops, sandy areas, grasslands, pastures, peat bogs, marshes, lake shores, quarries, mines, and urban areas. It is currently unknown whether breeding habitat is limiting Canadian populations of common nighthawk. Results of the habitat mapping indicate that approximately 20% of the Preliminary Proposed Corridor and corridor alternatives study areas provide suitable breeding habitat for nighthawk. This value does not consider existing disturbances (i.e., roads) that may provide suitable breeding habitat. As such, the 20% suitable breeding habitat is likely an underestimate, which suggests that breeding habitat is not a limiting factor for common nighthawk populations that overlap with the Project study areas at Base Case and that changes in habitat availability have not exceeded the adaptability or resilience limits of this criterion.

Project Case

The Preliminary Proposed Corridor is predicted to result in a direct loss of 372 ha of common nighthawk habitat. The Corridor Alternative Around Mishkeegogamang is predicted to result in a direct loss of 244 ha of common nighthawk habitat. The Corridor Alternative Through Mishkeegogamang is predicted to result in a direct loss of 253 ha of common nighthawk habitat. The abundance of habitat in the Project study areas is predicted to remain similar to Base Case conditions after construction of the preliminary proposed or corridor alternatives. Additional suitable habitat in the Project study areas may be temporarily avoided due to sensory disturbance during construction. The preliminary proposed or corridor alternatives would result in changes in movement patterns at local scales but these changes are not expected to alter the extent of occurrence of the population(s) that overlap with the Project study areas because common nighthawk are highly mobile and capable of using anthropogenic disturbances for breeding. Consequently, effects on common nighthawk populations that overlap the Project study areas from the preliminary proposed or corridor alternatives in the Project Case (which includes previous and existing developments) are predicted to be not significant.

Reasonably Foreseeable Developments Case

Habitat availability is not limiting for common nighthawk at Base Case or Reasonably Foreseeable Development Case and the predicted abundance in the Project study areas is predicted to remain similar during all assessment cases. The preliminary proposed or corridor alternatives combined with reasonably foreseeable developments has the potential to result in local changes in habitat connectivity, but likely not throughout the Project study areas, as the future developments only intersect portions of the Project study areas; connectivity among nighthawk populations should remain intact. Reasonably foreseeable developments may result in changes to nighthawk survival and reproduction in the Project study areas; however, it is assumed that the reasonably foreseeable developments will implement impact management measures that avoid and minimize effects. Overall, the weight of evidence from the analysis of the primary pathways predicts that cumulative changes to nighthawk habitat availability, habitat distribution, and survival and reproduction are within the resilience and adaptability limits of the species. The combined effects from the preliminary proposed or corridor alternatives and reasonably foreseeable developments should not have an adverse influence on common nighthawk populations in the Project study areas to be self-sustaining and ecologically effective. Consequently, the incremental and cumulative effects from the preliminary proposed or corridor alternatives and other past, present and reasonably foreseeable developments on common nighthawk in the Reasonably Foreseeable Development Case are predicted to be not significant.
Olive-sided Flycatcher

Base Case

Overall, habitat is well distributed and connected in the Project study areas. Existing disturbances in the Project study areas do not likely function as movement or dispersal barriers for this species in the Base Case. Habitat appears to be more contiguous in the southern two thirds of the Preliminary Proposed Corridor study area. In the corridor alternatives around the through Mishkeegogamang, suitable habitat is limited between the junction of Highway 642 and Highway 599 and Savant Lake; large, contiguous patches of habitat are primarily located between Savant Lake and Lake St. Joseph. Suitable habitat is patchily distributed north of Lake St. Joseph in all Project study areas.

In general, human developments have likely had a net negative change to olive-sided flycatcher habitat availability in the Project study areas, relative to historical conditions. Overall, fire suppression has likely reduced the amount of suitable olive-sided flycatcher habitat in the Project study areas, relative to what was historically present for this species. However, changes to habitat availability in the Project study areas are predicted to be within the resilience limits of this species.

The olive-sided flycatcher is an aerial insectivore and insect populations are showing large declines worldwide, which is likely contributing to the declining population trend for this species. Potential causes of reduced availability of prey include habitat loss, climate change resulting in a temporal mismatch between reproduction and peak food abundance, and pesticide use, which can reduce the abundance and diversity of flying insects. The Project study areas have likely been affected by these factors at Base Case. Olive-sided flycatcher may be particularly susceptible to these factors because they have low reproductive potential and the longest migration distance of all flycatchers. However, considering the availability and distribution of habitat, changes in survival and reproduction are expected to be within the resilience and adaptive capacity limits for this species.

Project Case

Past and existing developments in the Base Case have likely adversely affected habitat availability, habitat distribution, and survival and reproduction of olive-sided flycatcher in the Project study areas. Olive-sided flycatchers are primarily limited by habitat loss from fire suppression and declines in insect populations.

The Preliminary Proposed Corridor is predicted to result in a direct loss of 461 ha of moderate to high suitability olive-sided flycatcher habitat, while the corridor alternatives around and through Mishkeegogamang are predicted to result in a direct loss of 545 ha and 523 ha of moderate to high suitability olive-sided flycatcher habitat, respectively. Selective removal of incompatible vegetation, retention of trees in the 40-m-wide transmission line alignment ROW, where possible, and reclamation of temporary disturbances, including access roads and the 40-m-wide transmission line alignment right-of-way travel lane, will reduce the magnitude of effects from habitat loss due to the construction of the preliminary proposed or corridor alternatives. The combined evidence indicates that olive-sided flycatcher populations will continue to be self-sustaining and ecologically effective in the Project Case, relative to the Base Case. Consequently, effects from the Project and previous and existing developments on olive-sided flycatcher populations that overlap the Project study areas are predicted to be not significant.
Reasonably Foreseeable Developments Case

The combined evidence on the cumulative changes to habitat availability and distribution, and survival and reproduction in the Project study areas from Base Case to Reasonably Foreseeable Development Case indicates that olive-sided flycatcher populations would continue to be self-sustaining, although possibly at a lower abundance. Reductions of habitat availability, distribution, and survival and reproduction are not expected to affect the ecological effectiveness of olive-sided flycatcher in the Project study areas. Consequently, cumulative effects on olive-sided flycatcher in the Reasonably Foreseeable Development Case are predicted to be not significant.

Socio-economic Environment Baseline and Effects Assessment

Archaeological Resources

Base Case

Pre-historical and historical settlements in the region have been few and dispersed. Due to the general acidity of the soil on the Canadian Shield, which leads to a lack of organic preservation, the absolute number of known archaeological resources and the area of archaeological potential in northwestern Ontario is low relative to the size of the region. The relatively low number of known archaeological resources and relatively small area of archaeological potential in northwestern Ontario, and more specifically in the Project study areas, is also a reflection on the low number of archaeological surveys that have taken place in the region.

No known archaeological resources have previously been identified in the Project footprint for the corridor options. One known archaeological site was identified in the Preliminary Proposed Corridor study area related to a Pre-Contact Aboriginal archaeological site of unknown age. Five known archaeological sites were identified within the shared study area for the corridor alternatives: two archaeological sites of unknown age and cultural affiliation, two indeterminate Pre-Contact Aboriginal archaeological sites, and one multi-component site with both Historic Euro-Canadian and Pre-Contact Aboriginal Archaic artifacts.

Project Case

Alteration of the landscape can result in damage or destruction of both marine and terrestrial archaeological resources. These alterations can involve displacement of artifacts, resulting in the loss of valuable contextual information, or may result in the complete destruction of artifacts and features leading to complete loss of data.

Direct effects can be avoided by identifying and avoiding archaeological resources prior to ground disturbance, and by increasing the awareness of Project personnel about archaeological resources in proximity to the Project footprint. All required archaeological assessments (Stage 2, 3 or 4) will be undertaken in areas identified in the Stage 1 assessments as exhibiting archaeological potential before planned construction in these areas. Clearance for the Project, with respect to areas exhibiting archaeological potential, under the Ontario Heritage Act will be obtained before ground disturbance. To avoid loss of, or damage to, archaeological resources, archaeological sites identified in the Project footprint will be subject to avoidance and protection measures, or assessed and mitigated by excavation per the Standards and Guidelines for Consultant Archaeologists and in engagement with Aboriginal communities.

The net effect of the Project on the number, type and location of known archaeological resources, and the area of potential archaeological resources is predicted to be negligible with effective implementation of the impact management measures.
Reasonably Foreseeable Developments Case

Archaeological resources were not carried forward for assessment of cumulative effects because negligible net effects were predicted.

Heritage Resources

Base Case

Heritage resources include buildings, structures and landscapes that have cultural heritage value or interest as identified by a community. There are no known federally, provincially or municipally recognized cultural heritage resources in the Project study areas for all corridors. Potential cultural heritage resources within the Project study areas include former mining sites, a Roman Catholic Church and an Anglican Church.

Project Case

Cultural heritage resources in all three corridors could potentially be altered by vibration from construction equipment, clearing and grubbing of vegetation along the transmission line alignment right-of-way, creating access roads and trails, and other construction activities. As currently mapped, none of the potential heritage resources are within 60 m of the Project footprints and are not at potential risk for vibration effects, but the exact locations of these resources have not been field verified and may be inaccurate. Once the preferred corridor is selected, field surveys, research, and evaluation as part of a Cultural Heritage Evaluation Report will be completed to determine if any of the identified potential cultural heritage resources are of cultural heritage value or interest according the criteria prescribed in Ontario Regulation 9/06 and if other, not previously documented cultural heritage resources are present in the Project study area. If resources of cultural heritage value or interest are identified, the Cultural Heritage Evaluation Report may recommend site-specific Heritage Impact Assessments, which will recommend conservation measures to ensure all cultural heritage resources potentially affected by the Project are protected. With effective implementation of the impact management measures, the net effect of the Project on potential cultural heritage resources is predicted to be negligible for all three corridors and cultural heritage resources are expected to be protected from effects from the Project.

Reasonably Foreseeable Developments Case

Heritage resources were not carried forward for assessment of cumulative effects because negligible net effects were predicted.

Socio-economics

Base Case

The Project is located within the districts of Kenora and Thunder Bay and Algoma. Between 2006 and 2016, the District of Kenora experienced a small population increase, growing from 64,419 to 65,533 (or 1.7%) while the District of Thunder Bay saw a small decline in population, from 149,063 to 146,048 (or -2.0%). The population increase in the District of Kenora can be partly attributed to the high birthrates and overall growth in the Aboriginal population in the district. The decreasing population trend found in the District of Thunder Bay characterizes most other communities in the study area which experienced population declines that varied from 0.7% (Machin) to 19.0% (Pickle Lake). The exception to this trend is the community of Sioux Lookout, which experienced a modest population growth of 1.7%.
Seven Aboriginal communities are located within the socio-economic study areas including Eagle Lake First Nation (148), Lac Seul First Nation (205), Mishkeegogamang First Nation (203), Ojibway Nation of Saugeen (258), Slate Falls Nation (259), Cat Lake First Nation (216) and Wabigoon Lake Ojibway Nation (157). The Lac Seul First Nation and the Mishkeegogamang First Nation are the largest Aboriginal communities in the study areas, with 3,445 and 1,883 members, respectively. With the exception of Mishkeegogamang First Nation and Cat Lake First Nation, the majority of community members live off-reserve.

In 2011, the majority of the labour force (80.3% to 82.3%) in the Districts of Kenora and Thunder Bay was employed in service producing occupations including health care and social services, public administration, and retail trade. Goods producing occupations accounted for the remaining 17% to 20% of employment.

In 2011, the Districts of Kenora and Thunder Bay had an Aboriginal labour force of 8,070 and 6,990 respectively. Between 2006 and 2011, the participation rate of the Aboriginal population in District of Kenora increased by 2.8 percentage points from 56.4% to 59.2%, while participation rate in the District of Thunder Bay declined by 2.6 percentage points, falling from 58.6% to 56.0%.

The construction industry is a relatively important sector for the Lac Seul First Nation while mining and utilities employ a small proportion of the Mishkeegogamang First Nation labour force. Forestry and construction are important goods-producing sectors for Wabigoon Lake Ojibway Nation. Healthcare, education, and public administration are important sectors to all of the Aboriginal communities in the Project study areas.

There is a diverse range of industry activity in the Project study areas, with the Districts of Kenora and Thunder Bay supplying goods and services to residents, industrial, commercial and construction operations and projects in the region. The mining and forestry industries have historically been the primary drivers of the regional economy and goods and services supply and development in the Project study areas have occurred in response to demand created by these industries.

Temporary commercial accommodations, including hotels, motels and inns, within the Project study areas are located in the Township of Pickle Lake, Municipality of Sioux Lookout, Township of Ignace and City of Dryden. Hotel occupancy rates in North Western Ontario are highly seasonal with peak occupancy in July and August.

The Kenora District Service Board provides Land Ambulance and pre-hospital care to communities through North West Emergency Medical Services. Ambulance bases are located in nine communities across the District of Kenora, including Pickle Lake, Ignace, Sioux Lookout, and Dryden. Regional emergency medical services are available throughout the Project study areas including the Sioux Lookout Meno Ya Win Health Centre, Dryden Regional Health Centre, Pickle Lake Health Clinic and the Mary Bergland Community Health Centre in Ignace.

The Ontario Provincial Police provide policing services, with detachments in many of the communities located within the Project study areas. The Nishnawbe Aski Police Service provides policing services to many of the Aboriginal communities in the Project study areas, including Cat Lake First Nation, Mishkeegogamang First Nation, and Slate Falls First Nation. Fire services are available through both paid and volunteer fire departments. The Ontario Ministry of Natural Resources and Forestry Aviation, Forest Fire and Emergency Services responds to forest fires.
The road networks potentially used and affected by the Project include Sections of Highway 17, Highway 72, Highway 516, Highway 642 (preferred corridor), and Highway 599 (alternate corridors). Average Annual Daily Traffic on these highways is low in rural areas compared to sections near larger urban centres. There are several small airports, heliports, and airstrips in the Project study areas.

**Project Case**

Over the course of the approximately 18 to 24-month construction period, the Project is expected to require 480-600 full time equivalent of direct employment. Approximately nine full time equivalent of employment annually will be required to operate and maintain the Project. The relatively small direct and indirect employment numbers generated through Project construction, operation and maintenance indicates that the Project will not adversely affect labour market balance.

The Project would support total employment income of an estimated $200-$250 million over the 18-24 month construction period. Direct, indirect and induced employment associated with construction of the Project would temporarily boost average wage and salary levels and total community employment income within local communities. As such, a beneficial effect on employment income is predicted during the construction stage.

Business opportunities and revenues are expected to be created in response to Project-related demand for and spending on goods and services. A portion of these opportunities and revenues could be provided by local and regional businesses, representing a positive effect from the Project. During the construction stage, local and regional procurement opportunities are expected to generally consist of short-term contracts with firms to provide construction services and products. The Project will advertise all publicly available contracts, which will be open to all qualified businesses including local ventures and First Nations. For goods and services that may be sourced locally, the Project has committed to prioritising employment and procurement in Aboriginal communities. Project operations would require a relatively small amount of spending on goods and services for its operations. The spending that would occur for business suppliers in the study area would be mainly for general maintenance purposes. Any purchase of replacement equipment or materials would be primarily form supplies outside the immediate study area.

The Project will contribute to provincial, municipal and First Nation government revenues through payment, such as taxes, through all Project stages. While these payments will represent a positive effect of the Project and will be a consistent revenue stream for receiving governments over the long-term, the amount is not expected to be substantial in terms of total government revenues for the province, municipalities or First Nations.

Three temporary construction camps are planned for the Preliminary Proposed Corridor, housing between 300 and 450 workers in total. The Project will require specialized contractors and suppliers from outside the region and some of these contractors and suppliers will require temporary accommodation. It is anticipated that during peak construction periods, the work camps along the Preliminary Proposed Corridor will be at capacity with the direct workforce and some contractors and suppliers will secure temporary accommodation in nearby communities (e.g., Sioux Lookout, Dryden, and Pickle Lake). An estimated 50-200 direct construction workers will potentially require temporary housing during peak construction. It is unlikely that all of the workers can be comfortably housed in local communities if peak construction falls during the peak tourism season.
Four temporary construction camps are planned for the corridor alternatives around and through Mishkeegogamang housing between 400 and 600 workers in total. As with the Preliminary Proposed Corridor temporary accommodation will be required for specialized contractors and suppliers from outside the region. An estimated 100 workers will potentially require housing in the temporary accommodation during peak construction. It is likely that all of the workers could be housed local communities even if peak construction falls during the peak tourism season.

Project-induced in-migration during construction is not anticipated; therefore, the Project is not anticipated to have adverse effects to the availability and access to education services, non-emergency healthcare services, social services, recreational services, and water, waste and power supply and infrastructure. Project use of and demand on emergency services is not expected to adversely affect service capacity or regional government expenditure outlays.

The Project will use local transportation networks during construction. No effect on maintenance of road transportation availability and access is expected. The Project’s net effect on local road transportation and shipping and port services is assessed as not significant.

The potential Project nuisance effects on community wellbeing were assessed taking into consideration the changes to air quality from fugitive dust emissions and noise during Project construction and potential for these changes to result in nuisance effects on sensitive human receptors. Nuisance effects associated with air quality are expected to be negligible, and would not affect community or individual wellbeing.

After the implementation of impact management measures, the short-term construction noise at several sensitive receptors along the Project footprint are anticipated to be above the 6.5% change threshold identified by Health Canada. It is noted, however, that construction noise will be temporary in nature, occur only during a specific activity, and be localized within the Project study areas. Construction will take place during daytime hours and an engagement program will be in place to notify residences of upcoming work. In addition, while the Project construction period is two years, the length of time spent at each location throughout the Project area will be substantially less than two years, likely less than one year. During the operation and maintenance stage, noise at the sensitive receptors is not expected to be above the 6.5% change threshold identified by Health Canada.

Reasonably Foreseeable Developments Case

There is potential for cumulative effects from the Project’s net effects on the demand for rental housing and temporary accommodation due to potential overlap with the Energy East Pipeline project and the Treasury Metals Inc. Goliath Gold project if these projects move forward on a similar time frame. To proactively address this potential cumulative effect, Wataynikaneyap will work with the local communities to develop a housing management plan to support non-local construction direct and indirect workers to obtain suitable accommodation when units are not available at the construction camps. For housing and temporary accommodation, the cumulative effect of change in rental housing and temporary accommodation availability and supply is considered to be negative, short-term as the effect is only anticipated during peak construction, and not significant.
Non-Aboriginal Land and Resource Use

Base Case

The Project footprint for the Preliminary Proposed Corridor crosses two provincial parks (East English River and Minnitaki Kames Provincial Park), and the Cat Lake Slate Falls Community-based Land Use Plan Dedicated Protected Area. The Project footprint for the corridor alternatives cross three provincial parks (East English River, St. Raphael Lake Provincial Park, and Sandbar Lake Provincial).

The Project is in Ministry of Natural Resources regulated Wildlife Management Units, Fisheries Management Zones, Bear Management Areas, Active Trapline Areas and Bait Harvest Areas. Moose, deer and bear are actively hunted, and trapping is actively practiced, in the Project study areas. Angling is the most popular harvesting activity in the Project study areas.

Aquatic recreation, motorized recreation and camp, cabin and cottage sites are common in the Project study areas. Approximately 79 camps, cabins and cottages are located within the Preliminary Proposed Corridor study area, but none are transected by the Project footprint. Approximately 47 camps, cabins and cottages are located within the Corridor Alternative Around Mishkeegogamang study area, with three locations transected by the Project footprint. Approximately 53 camps, cabins and cottages are located within the Corridor Alternative Through Mishkeegogamang study area, with three locations transected by the Project footprint.

Mining, aggregate extraction, forestry, agriculture and waterpower are commercial industry land uses occurring in the Project study areas. The Project footprint of the Preliminary Proposed Corridor crosses 89 active mining claims, four forest management units and 0.2 ha of agricultural land. Six potential waterpower generation locations are located within the Preliminary Proposed Corridor study area, with one location transected by the Project footprint. The Project footprint of the Corridor Alternative Around Mishkeegogamang crosses 60 active mining claims and three forest management units. Four potential waterpower generation locations are located within the Corridor Alternative Around Mishkeegogamang study area, but none are transected by the Project footprint. The Project footprint of the Corridor Alternative Through Mishkeegogamang crosses 60 active mining claims and three forest management units. Four potential waterpower generation locations are located within the Corridor Alternative Through Mishkeegogamang study area, but none are transected by the Project footprint.

Project Case

The Project footprint for the Preliminary Proposed Corridor crosses approximately 2 ha of East English River Provincial Park, 1 ha of Minnitaki Kames Provincial Nature Reserve, and 16 ha of Cat Lake Slate Falls Community-based Land Use Plan Dedicated Protected Area. The Project footprint for the corridor alternatives cross 3 ha of East English River Provincial Park, 19 ha of St. Raphael Lake Provincial Park, and 38 ha of Sandbar Lake Provincial Park.

Although access to and use of these parks and protected areas may face temporary restrictions during the construction stage (i.e., an 18 to 24-month timeframe), the disturbance to access, parklands and associated roads will not be continuously in effect for the entire construction stage, as construction will be completed using a staged approach. Temporary access restrictions will only be put in place for a few weeks to a few months in segmented areas within the larger construction schedule, as Project construction progresses along the 40-m-wide transmission line alignment ROW. Access and use of disturbed areas will be permitted throughout operation, and while resulting in some changes to the visual aesthetic of cleared areas, negligible effects on the continued use
and enjoyment of parks and protected areas are expected due to the small proportion of each park or protected area affected by the clearing of the Project footprint.

Disturbances and reductions in access would be experienced at the local level, predominantly where mining, aggregate, forestry and agricultural activities overlap the Project footprint, although effects to commercial industrial operations may experience effects locally due to indirect effects of Project traffic. Wataynikaneyap will meet all regulatory requirements and address potential effects to commercial industrial users (including tenure holders) by engaging, negotiating, and developing mutually beneficial agreements that address potential effects, including compensation, where relevant. As a result of these impact management measures, negligible net effects are anticipated on land use quantity available for commercial industrial land use, access and operations.

Project construction may occur within areas used for outdoor tourism and recreation. As a result, Project construction may temporarily reduce or limit access to lands available for terrestrial or aquatic tourism and recreation (e.g., hunting, trapping, fishing, guided outfitting, bait harvest collection, cottaging, hiking, cycling camping and other recreational and tourism activities), partially displacing users both due to the activities taking place and in order to make sure user safety.

Based on feedback from primary data collection interviews with outdoor tourism and recreation land users and through other Project experience in Northern Ontario, effects to outdoor tourism created by the Project may be considered to be positive or negative depending on the land user in question. Hunters, anglers and trappers are likely to perceive new, additional land base access to areas as beneficial, creating new opportunities and areas to participate in hunting, trapping and fishing activities. However, guided outfitters, who operate commercially and have benefited from exclusive or limited access to certain areas (i.e., creating visitor experiences based on values of remoteness and wilderness) are likely to see the expansion of access to have a negative effect on their activities. The potential increases in land quantity/access will still allow for existing users to continue hunting, trapping, angling, guided outfitting and conducting other tourism and recreation opportunities. As these activities can be maintained, net effects on this criterion are therefore considered to be not significant.

Reasonably Foreseeable Developments Case

Similar to the Project Case, cumulative effects to outdoor tourism and recreation may be measurable at the individual, organizational or community level; however, potential increases in land quantity and access will still allow for continued hunting, trapping, angling, guided outfitting and other tourism and recreation opportunities by existing users. As these activities can be maintained, cumulative effects on this criterion are therefore considered to be not significant.

Visual Aesthetics

Base Case

The regional setting for the Project is characterised by the Ontario Shield Ecozone which comprises Ontario's portion of the boreal forest. The topography of the Ontario Shield Ecozone is generally gently rolling terrain with broadly sloping uplands and frequent depressions and deposits (i.e., eskers, moraines, drumlins, and faults) that form the areas numerous lakes, streams, ponds and wetlands. This terrain is predominantly covered by coniferous boreal forest in the northern and central part of the ecozone and mixed and deciduous forests of hardwoods found in the southern portion of the ecozone. Wetlands (i.e., fens and bogs) are located throughout in poorly drained areas and feature grasses and sedges with generally sparse and small coniferous trees.
Key viewpoints were identified for the corridor options related to communities, transportation routes, recreation/tourism and provincial parks. Assessment of the key viewpoints identified suggest that most viewing opportunities are of a predominately natural setting which may include evident disturbance from transportation infrastructure (e.g., roadway), or from residential development.

**Project Case**

Visual disturbances are expected to begin during the construction stage and continue incrementally over the full period. Construction activities related to transportation and distribution of personnel, equipment and materials along access roads and trails, the transmission line right-of-way, and at temporary construction facilities and infrastructure sites (i.e., temporary camps and laydown areas) will create temporary changes in visual quality.

Further, construction activities related to site preparation (e.g., clearing of vegetation along the 40-m-wide transmission line alignment right-of-way and construction of right-of-way access roads), grading along access roads and the right-of-way as required, the erection of transmission structures and conductors, and the construction of a connection facility and transformer station will create persistent changes in visual quality by removing vegetation, modifying landforms, and introducing built structures. These changes will remain for subsequent operation and maintenance stages which are anticipated to continue for an indeterminate time period as retirement or decommissioning is not anticipated. Transmission structures will be most evident located on top of hills, along ridges, and spanning water courses or roadways where they would be set against a backdrop of sky.

New access roads will produce a disturbance in forested areas resulting from vegetation removal, grading and gravel surfacing. Changes will likely be most evident where they are visible in foreground viewing distances. The upgrade of existing access roads (e.g., widening, surface hardening) will also result in limited vegetation removal. In areas of flat terrain, roads will not be easily seen due to vegetation screening, unless viewed from a high angle viewing location.

The connection facilities and transformer will require the clearing of forest and grading of near 1 ha and 1.5 ha areas respectively. However, these sites are located in areas with existing disturbance including roadway infrastructure (i.e., Highway 17) and existing transmission structures (i.e., the Musselwhite Switching Station and Hydro One transmission lines) which will reduce the contrast of these components.

Most of the Project is expected to be partially or fully screened by landforms and/or vegetation and would be either not visible or have limited visibility from many viewing opportunities along major roadways (i.e., Highway 17, Highway 642, Highway 516), and at most recreation and tourism sites, parks, and communities or settlements. The Project’s net effect on visual aesthetics is characterized as a generally low level of visual change occurring over a long-term to permanent duration within a resilient visual context that would not result in change to the existing landscape character. Consequently, the Project’s net effect on visual aesthetics are considered to be not significant.

**Reasonably Foreseeable Developments Case**

Net adverse cumulative effects are likely to occur in the Project study areas as a result of cumulative effects between construction and operation of the Project and visual changes to the landscape from ongoing, certain/planned and reasonably foreseeable developments, including commercial forestry operations, transportation infrastructure development, mineral exploration and mining activity.
Considering the visual characteristics of the Base Case context, which includes mostly hilly topography with distinct features (i.e., steep cliffs and rounded ridges), predominately mixed coniferous forest, and evident patterns of existing disturbance from forestry, mining, transportation and utility infrastructure, along with the apparent value of the visual landscape for local residential, tourism, and recreational uses and sites, a moderate level of resilience is demonstrated in the Project study areas to absorb some additional visual change and retain its existing visual quality. Net cumulative effects on the visual aesthetics are determined to be not significant.

Human Health

**Base Case**

The scope of the Human Health Risk Assessment includes the assessment of potential human health risks from short-term (or acute) and long-term (or chronic) inhalation exposure to chemicals and from exposure to particulate matter emitted to air during the construction stage of the Project. Potential human health risks from the contaminants of potential concern in air with available background concentrations were considered to be negligible. For diesel particulate matter for the 1-hour and annual averaging periods, potential human health risks could not be determined because background air concentrations were not available.

**Project Case**

All three corridors could potentially affect human health through the release of criteria air contaminants and fugitive dust emissions. The implementation of impact management measures, including an Air Quality Management Plan, are expected to limit adverse effects on air quality. Negligible net effects for all three corridors are predicted on changes in air quality that could affect human health.

All three corridors could also potentially affect human health through noise emissions during construction and operation. While noise emissions during construction may exceed regulatory benchmarks (i.e., a health effect through annoyance) established by Health Canada, effects are expected to be short-term, low magnitude and not significant.

**Reasonably Foreseeable Developments Case**

Human health was not carried forward for assessment of cumulative effects because negligible net effects were predicted.

**Aboriginal and Treaty Rights and Interests**

The Ministry of Energy has delegated procedural aspects of Aboriginal engagement on the Project to Wataynikaneyap through two instruments; a letter dated February 13, 2013 and a letter dated November 28, 2016 and executed Memorandum of Understanding dated November 23, 2016. In these documents, the Crown identified the Aboriginal communities that should be engaged on the basis that they have or may have constitutionally protected Aboriginal or Treaty Rights that may be adversely affected by the Project.

Project effects on Aboriginal and Treaty Rights focused on the following Group 1 communities:

- Eagle Lake First Nation;
- Lac Seul First Nation;
- Mishkeegogamang First Nation;
ENVIRONMENTAL ASSESSMENT REPORT FOR THE PHASE 1 NEW TRANSMISSION LINE TO PICKLE LAKE PROJECT

- Ojibway Nation of Saugeen;
- Slate Falls Nation;
- Wabigoon Lake Ojibway Nation (Waabigoniiw Saaga’iganiiw Anishinaabeg); and
- Métis Nation Ontario Region 1 Consultation Committee¹ (MNO R1CC).
- Eabametoong First Nation, which has a shared land use planning area with Mishkeegogamang First Nation. Because the communities jointly define this as a shared use area, they have been engaged with respect to effects on Aboriginal and Treaty Rights.
- Cat Lake First Nation, shares traditional lands with Slate Falls Nation. These lands were defined in the community-based land use plan. Phase 1 passes this area so they have been engaged with respect to effects on Aboriginal and Treaty Rights.

Lac des Milles Lacs First Nation is not a Group 1 community; however they have indicated that they may have traditional land and resource use that is potentially affected by the Project within the local study area. Therefore, a discussion on the status of traditional land and resource use data collection with Lac des Milles Lacs First Nation at the time of submission of this report is provided. The Ministry of Energy has been informed by Wataynikaneyap of the assertion of a potential effect. This section also includes information received regarding Aboriginal communities’ interests as of May 31, 2017. Aboriginal interests are not protected through Treaty or as Aboriginal Rights under Section 35 of the Constitution Act 1982, but are matters of concern or interest to Aboriginal people. The identified interests are addressed in other sections of this report and not discussed here.

**Base Case**

The Base Case characterization was developed through a desktop review of existing information, engagement with Aboriginal communities and a focussed traditional land and resource use study. Wataynikaneyap, through the communities, implemented a focused traditional land and resource use study with the following communities: Eagle Lake First Nation, Slate Falls Nation, Cat Lake First Nation, Wabigoon Lake Ojibway Nation and Lac Seul First Nation. Wabauskang First Nation and Eabametoong First Nation were provided capacity funding to complete their own traditional land and resource use study. The traditional land and resource use study was used to identify land and resource use that may be affected by the Project so as to address potential rights infringement and to identify potential Project design revisions or additional impact management measures to remove or minimize the identified potential effect. The traditional land and resource use study included community-based research to identify land and resource users in the vicinity of the Project. Communities involved in the traditional land and resource use study have only provided information that pertains to the Preliminary Proposed Corridor Dinorwic (east of Dryden) to Pickle Lake. To date no traditional land and resource use or traditional knowledge has been provided, or collected with respect to the alternatives

¹ Métis Nation Ontario Region 1 Consultation Committee (MNO R1CC) has been identified by the MNO and in the Ministry of Energy MOU as the Aboriginal group for engagement. R1CC includes members from the Atikokan and Area Métis Council, Kenora Métis Council, Northwest Métis Council and Sunset Country Métis Council.
Table 3 provides a summary of resource and use areas and the number of users that could be potentially affected. The number of users is based on interviewee’s providing information but actual users may be higher or lower since multiple users from families use the same resources.

### Table 3: Summary of Traditional Land and Resource Use Data and Information

<table>
<thead>
<tr>
<th>Type of Traditional Land and Resource Site</th>
<th>Number of Resource Users Affected</th>
<th>Description</th>
<th>Preliminary Proposed Corridor</th>
</tr>
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<tbody>
<tr>
<td>Active First Nation trapline areas</td>
<td>2</td>
<td>In proximity to lakes; use of mining trail</td>
<td>4 0</td>
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<tr>
<td>Trappers cabins</td>
<td>2</td>
<td>One at LSA border</td>
<td>1 0</td>
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<td>Hunting areas</td>
<td>10</td>
<td>Along existing roads; two locations</td>
<td>10 Multiple (roads)</td>
</tr>
<tr>
<td>Access roads</td>
<td>&gt;10</td>
<td>Existing access roads</td>
<td>Yes(^2) Yes</td>
</tr>
<tr>
<td>Snowmobile trails</td>
<td>unknown</td>
<td>Unsure if still in use</td>
<td>1 1</td>
</tr>
<tr>
<td>Canoe/aquatic routes</td>
<td>2</td>
<td>Streams or river used for travel</td>
<td>2 2</td>
</tr>
<tr>
<td>Aquatic access points</td>
<td>3</td>
<td>Boat launches</td>
<td>3 0</td>
</tr>
<tr>
<td>Portage</td>
<td>2</td>
<td>Trails for accessing lakes</td>
<td>2 1</td>
</tr>
<tr>
<td>Fishing areas</td>
<td>14 (approximate multiple users of same area in families)</td>
<td>Includes Lakes that are fished that are partly overlapped by LSA</td>
<td>19 0</td>
</tr>
</tbody>
</table>

Note: >= greater than.

### Project Case

The assessment focused on potential Project effects related to hunting, fishing, trapping, agriculture/horticulture and plant gathering opportunities, and sensitive cultural sites, including changes in resources, access and perceived quality of lands and resources. The potential effects to Aboriginal and Treaty Rights for the corridor alternatives is not yet fully understood at the time of preparation of this report.

Portions of First Nations homelands will be required for the 40-m-wide transmission line alignment right-of-way. Significant effects to Aboriginal and Treaty Rights and Interests are not predicted because there will be no permanent loss of access, harvesting will be permitted within the right-of-way, and significant effects to the quantity and quality of harvested species and cultural use areas are not anticipated. Wataynikaneyap will commit to design the Project to avoid or minimize culturally sensitive sites should they be identified.

\(^2\) All roads used for access to resources could not be precisely identified in interviews. Changes in access occur as forestry roads are decommissioned.
Reasonably Foreseeable Developments Case

Cumulative effects to Aboriginal and Treaty Rights may be identifiable at the individual or community level; however, potential effects to resources, land quantity, and access will still allow for continued hunting, trapping, fishing, and gathering by existing users. As these activities can be maintained, cumulative effects on this criterion are therefore considered to be not significant.

Prediction Confidence

The confidence in the predicted effects assessment for the Aboriginal and Treaty Rights environment is rated as moderate for the Preliminary Proposed Corridor as the potential effects to Aboriginal and Treaty Rights is not fully understood. For those Aboriginal communities that have been engaged, traditional land and resource use studies have been completed. These communities include Cat Lake First Nation, Slate Falls Nation, Eagle Lake First Nation, Lac Seul First Nation and Wabigoon Lake Ojibway First Nation. Data and information collected for these communities engaged is determined to be sufficient to understand current traditional land and resource use and potential effects to Aboriginal and Treaty Rights. Spatial land use features, Aboriginal access routes and modes for engaged communities, and the availability of traditional land and resource use opportunities in the local study area are also well understood. The rating of moderate considers the following:

- ongoing engagement with the MNO R1CC to enable the provision of information on Métis citizen harvesting in the local study area;
- despite extensive and continued efforts to engage with members of Mishkeegogamang First Nation and Ojibway Nation of Saugeen, and meetings with their leadership teams, no information has yet been forthcoming from these communities; and
- ongoing engagement with Lac des Milles Lacs First Nation to collect further traditional land and resource use input.

Wataynikaneyap will continue to engage with Mishkeegogamang First Nation, Lac des Milles Lacs First Nation and MNO R1CC to collect traditional land and resource use data and information, understand potential effects to Aboriginal and Treaty Rights; and to consider these potential effects in Project design.

A full appreciation of the potential effects to Aboriginal and Treaty Rights for the corridor alternatives is not yet understood at the time of preparation of this report. As noted, traditional land and resource use data and information has not yet been provided by all communities whose Aboriginal and Treaty Rights may be affected by the Project. These communities include Mishkeegogamang First Nation, Eabametoong First Nation, Ojibway Nation of Saugeen, Lac des Milles Lacs First Nation, and MNO R1CC. Wataynikaneyap will continue efforts to engage with these communities.
Environmental and Social Management Plan

The draft Environmental and Social Management Plan outlines Wataynikaneyap’s corporate commitment to managing and carrying out the Project in a responsible, safe and sustainable manner whereby protection of the environment and safety of people take priority above all other business matters. The draft Environmental and Social Management Plan will contain specific action plans, standards and procedures that all Wataynikaneyap’s employees, consultants and contractors must adopt and adhere to when working under Wataynikaneyap’s supervision.

The purpose of the draft Environmental and Social Management Plan is to make sure that social and environmental effects, risks and liabilities identified during the environmental assessment process are effectively managed during the construction, operation and maintenance, and retirement of the Project. The draft Environmental and Social Management Plan specifies the impact management measures as best management practices to which Wataynikaneyap is committed to implement to reduce and preferably to prevent negative effects while enhancing the benefits. These best management practices have guided the environmental assessment process. In many cases, potential negative effects have been avoided through careful design and location of facilities.

Monitoring and Commitments

The Project has been designed to incorporate impact management measures to minimize the potential for environmental effects. An effective monitoring program provides results to indicate if the assumptions used in the assessment were correct and if impact management measures are effective. An effective monitoring program also identifies unforeseen problems so they can be addressed in a timely manner by the proponent.

Monitoring programs proposed include both compliance monitoring and effects monitoring. Compliance monitoring assesses if the Project has been constructed and operated according to the commitments made in the environmental assessment and the conditions of the Environmental Assessment Act approval. Effects monitoring is focused on assessing the environmental effects of the Project and this requirement will be determined as part of the conditions for approval.
Final Corridor Routing Analysis

As part of the Amended Terms of Reference, Wataynikaneyap committed to completing a comparative analysis of the environmental effects for each discipline (i.e., criteria) between the Preliminary Proposed Corridor and the corridor alternatives using environmental assessment, cost and constructability and technical criteria. The environmental assessment criteria are the physical (e.g., air), biological (e.g., fish and fish habitat, wildlife), socioeconomic, non-Aboriginal land and resource use and Aboriginal Rights and Treaty criteria used for the Draft Environmental Assessment Report. The cost and constructability and technical categories are based on the initial screening level corridor routing analysis included in the Amended Terms of Reference. These criteria were developed based on the experience of the environmental assessment and design team in completing transmission line projects in Ontario. Scores were applied to each criteria and then a final score was determined for each corridor.

Based on this analysis, the Preliminary Proposed Corridor has the highest overall score with 77.5%. The Corridor Alternative Around Mishkeegogamang has an overall score of 65.8% and the Corridor Alternative Through Mishkeegogamang has an overall score of 68.7%.

Under the cost and constructability category, the Preliminary Proposed Corridor scored highest with 26.3% because it will involve less large and very large watercourse crossings, angle points, and private land crossings than either of the corridor alternatives. The Preliminary Proposed Corridor also does not traverse a First Nation reserve which presents an additional logistical constraint to proceeding with the Project because of the permitting and approvals that would be required.

The Preliminary Proposed Corridor had the second highest score for the environmental assessment category with 34.9% compared to the Corridor Alternative Through Mishkeegogamang which scored 35.6%. The difference in these category scores is only 0.7%. The results of the environmental assessment for the corridors indicate that the Preliminary Proposed Corridor will have less direct loss of habitat for the little brown myotis, bald eagle, and olive-sided flycatcher criteria. The Preliminary Proposed Corridor will also have less effect on caribou ranges as it only traverses the Churchill and Kinloch ranges and completely avoids the Brightsand Range.

The scores for the corridors under the technical category are similar, with the Preliminary Proposed Corridor being somewhat less favourable because it has approximately 30 km of the proposed 40-m-wide transmission line alignment right-of-way close to the existing E1C transmission line.

Based on the final corridor analysis, the Preliminary Proposed Corridor has been identified as the preferred undertaking for the Project.
Conclusions

Transmission reliability and expansion to Pickle Lake has been identified in Ontario’s *Achieving Balance Long-Term Energy Plan* (released in November 2013) as a key priority for the connection of Aboriginal communities in northwestern Ontario to the provincial grid. Construction of the Phase 1 Project is required for the Phase 2: Connecting 17 Remote First Nations Project to proceed which will connect 17 remote First Nation communities, currently powered by diesel generation, to the provincial electrical grid. Wataynikaneyap will own, construct, operate, and maintain the Phase 1 Project.

An analysis of the Preliminary Proposed Corridor, two corridor alternatives, and associated Project components, was completed to identify the preferred corridor, based on environmental assessment, cost and constructability and technical criteria and indicators. Based on this analysis and the advantages and disadvantages of each corridor, the Dinorwic (east of Dryden) to Pickle Lake corridor (Preliminary Proposed Corridor) and associated Project components is identified as the preferred undertaking for which Wataynikaneyap seeks approval.

Engineering requirements, environmental considerations, input from engagement, and construction and operational safety considerations have all been incorporated into the Project design.

Proceeding with the Project will have environmental effects. However, the finding of this Draft Environmental Assessment Report have determined that the incremental effects associated with the Project can be effectively mitigated by standard and specific environmental protection measures.

Net adverse environmental effects of the Project in combination with past, existing, and reasonably foreseeable developments, have been predicted to be not significant for all environmental criteria, except for two wildlife criteria: woodland caribou in the Churchill and Brightsand ranges and little brown myotis. The Churchill and Brightsand caribou populations are not considered self-sustaining, and therefore significantly impacted at Base Case. Little brown myotis in the Project study areas has been conservatively considered as not likely to be self-sustaining in the Base Case and significantly impacted because of the presence of white-nose syndrome. For both criteria, combined effects from the Project and existing developments are predicted to remain significant in the Project Case; however ecological effectiveness is not predicted to be completely lost.
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<td>AADT</td>
<td>Average Annual Daily Traffic Count</td>
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<tr>
<td>AC</td>
<td>Alternating Current</td>
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<tr>
<td>ACSR</td>
<td>aluminum conductor steel reinforced</td>
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<td>AMIS</td>
<td>Abandoned Mines Information System</td>
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<td>ANSI</td>
<td>Area of Natural Scientific Interest</td>
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<td>AP</td>
<td>Assessment Point</td>
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<td>ARU</td>
<td>acoustic recording unit</td>
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<td>Carbon dioxide equivalent</td>
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# ACRONYMS

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# ENVIRONMENTAL ASSESSMENT REPORT FOR THE PHASE 1 NEW TRANSMISSION LINE TO PICKLE LAKE PROJECT

## ACRONYMS

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