

Marten Falls First Nation

# Proposed Terms of Reference Marten Falls Community Access Road – Environmental Assessment

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## Section: 7

**Date:** September 2020

**Project #:** 60593122

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## 7. Existing Environment and Potential Environmental Effects

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### 7.1 Description of the Environment and Methods to Characterize the Environment

The EAA requires a description of the environment that may be affected or reasonably expected to be affected, directly or indirectly, by the alternatives and the undertaking. This section provides a preliminary description of the existing environmental conditions that may be potentially affected by the Project. The description of the environment will address components of the environment that are included in the EAA definition, which includes a general description of the social, cultural, economic, built and natural environments. This section also identifies the methods that will be used to characterize the existing environmental conditions. The methods are the ‘tools’ that will be used to obtain information, such as field investigations and studies planned for the Project.

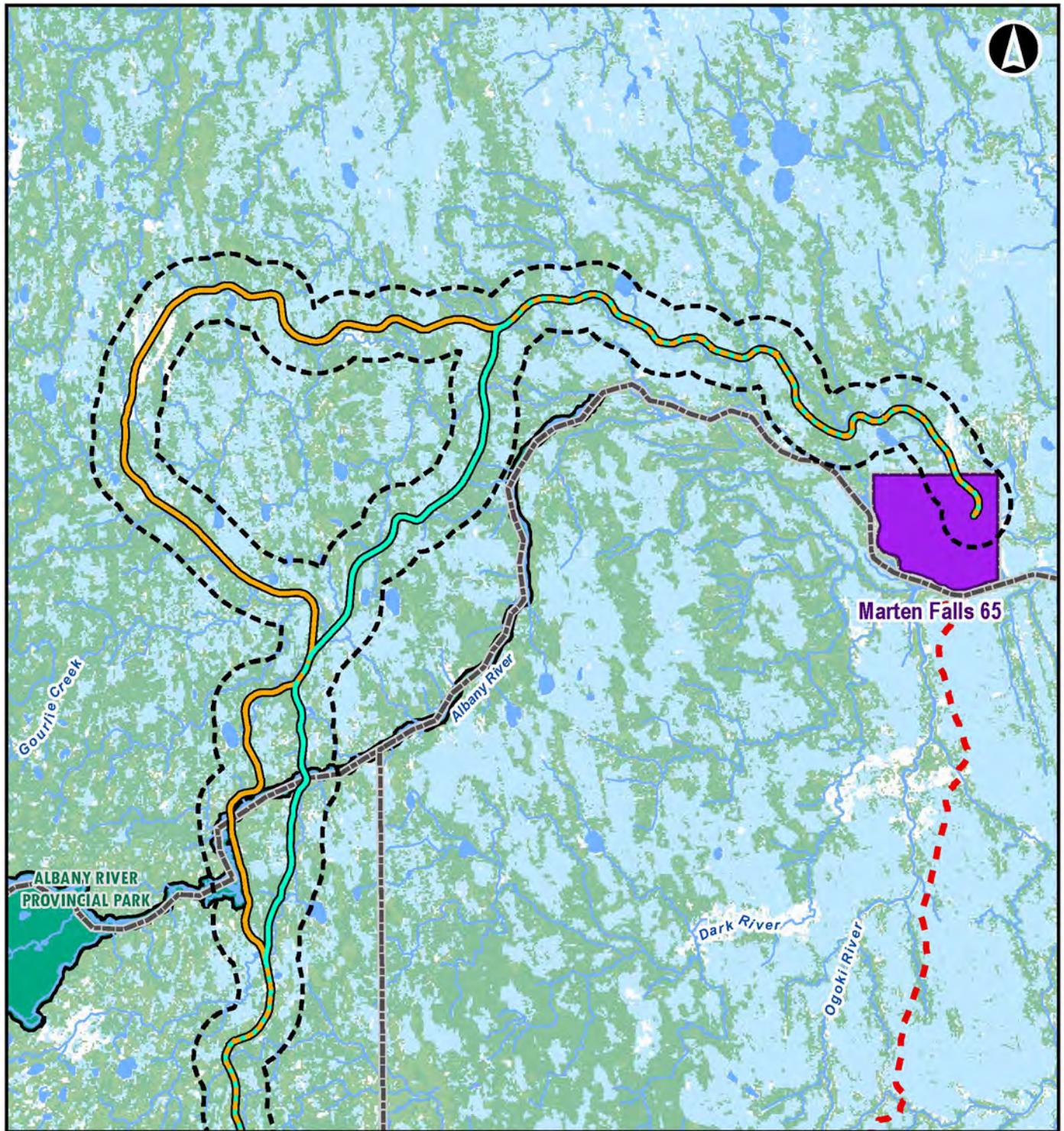
#### 7.1.1 Preliminary Study Area

The description of the environment provided in **Section 7.1.4** is for the general area of the Project, which includes the area encompassing the alternative routes shown on **Figure 6-1**. However, the Code of Practice requires a study area for the EA be identified in the ToR (MECP 2020). A study area is the area within which activities associated with an undertaking will occur and where potential environmental effects will be studied.

The preliminary study area for the purposes of the ToR is shown on **Figure 7-1**. The preliminary study area includes the area within 2.5 km of each side of the centreline of each alternative route (resulting in a 5 km wide study area). The preliminary study area generally allows for the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide study area provides flexibility for route refinements that may arise during the EA process through advancement of design (e.g., adjustment of the road alignment to avoid features).

The specific location of Project components, including the roadway, quarries, borrow areas, aggregate source areas and temporary infrastructure, are not yet known and will be determined in the EA. While most of the Project components are expected to be located within the preliminary study area, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the EA process. If the need to locate Project components outside the 5 km wide study area is determined to be required or of benefit to the Project, the study area would be adjusted.

Therefore, the 5 km wide study area is considered preliminary and will be refined in the EA through the identification of discipline-specific local and regional study areas. In some cases, a discipline-specific study area may be larger than the preliminary study area (e.g., caribou), and are anticipated to be identified shortly after the commencement of the EA.



Marten Falls 65

Gourlie Creek

Albany River

Dark River

Ogoki River

ALBANY RIVER PROVINCIAL PARK



Map Location

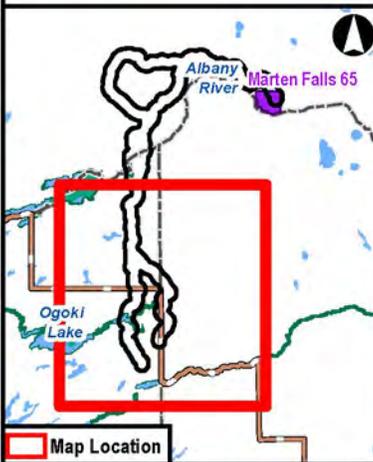
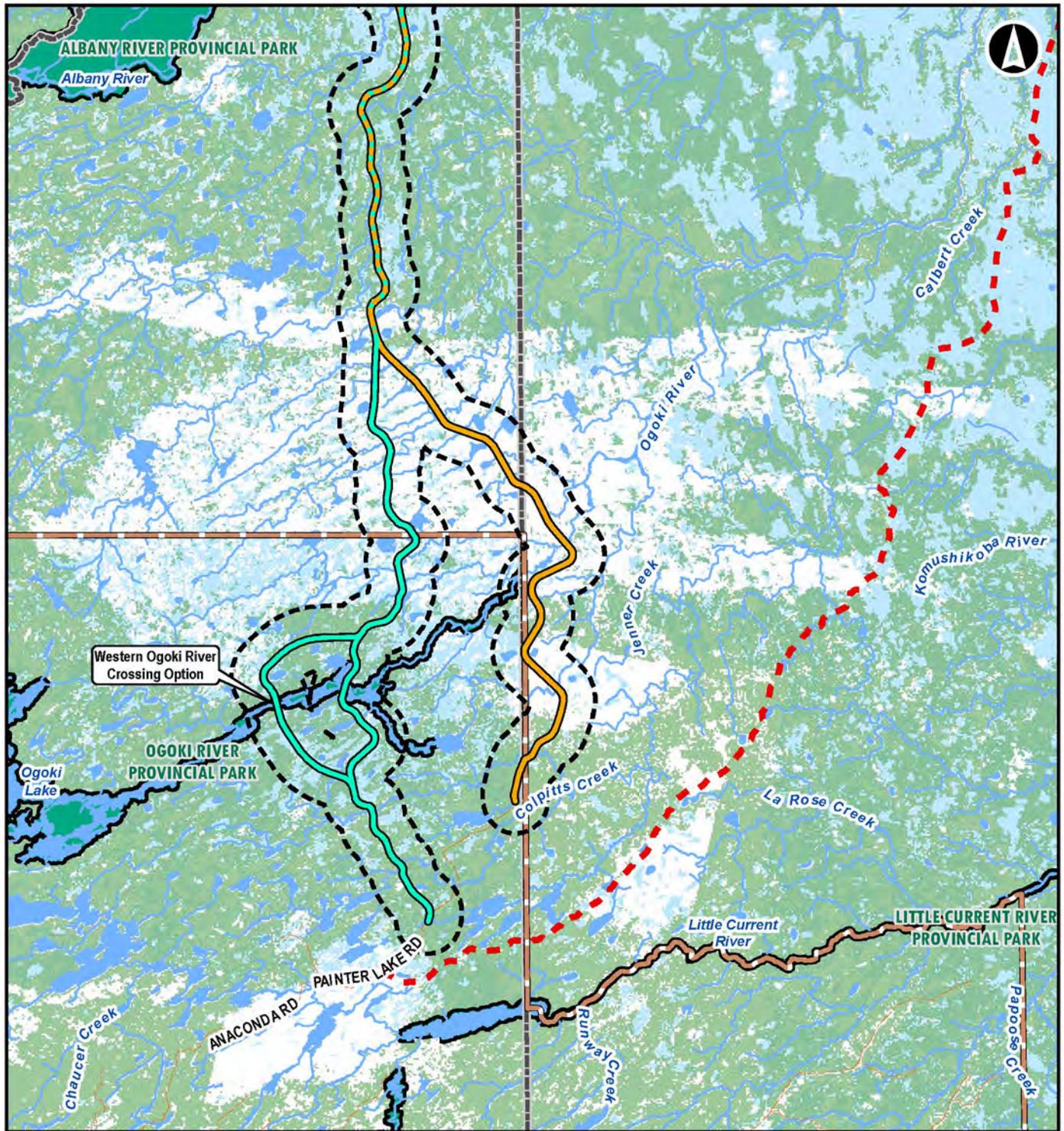
**Legend**

- Study Area
- Route Alternatives
  - Alternative 1
  - Alternative 4
- Alternative 4
- MFFN Existing Winter Access Road
- Provincial Park
- Wetlands
- Far North Boundary
- First Nation Reserve
- District Municipal Boundary

<b>Marten Falls First Nation All Season Community Access Road</b>		
<b>Preliminary Study Area</b>		
Datum: NAD 1983 UTM Zone 16N		
Aug. 2020	1:450,000 <small>(as per posted 3.5'x11")</small>	Data Sources: MNR, MMAH, NRCAN
P# 60593122	Rev: 00	
<b>AECOM</b>		<b>Figure 7-1A</b>

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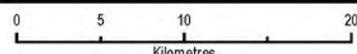


**Legend**

- Study Area
- Route Alternatives**
- Alternative 1
- Alternative 4
- General Features**
- Resource / Recreation Road
- MFFN Existing Winter Access Road
- Provincial Park
- Woodlands
- Wetlands
- Far North Boundary
- District Municipal Boundary

**Marten Falls First Nation  
All Season Community Access Road**

**Preliminary Study Area**



Datum: NAD 1983 UTM Zone 16N

Aug. 2020	1:450,000	Data Sources: MNR, MMAH, NRCAN
P#: 60593122	Rev: 00	

**AECOM** Figure 7-1B

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## 7.1.2 Environmental Features

The MECP's Code of Practice states that the description of the environment provided in a ToR is intended to be an overview of the existing conditions and address the features of the environment as defined in the EAA:

- a) "air, land or water;
- b) plant and animal life, including human life;
- c) the social, economic and cultural conditions that influence the life of humans or a community;
- d) any building, structure, machine or other device or thing made by humans;
- e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or,
- f) any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario."

The ToR provides a general description of the environment based on features that may be affected by the Project. Similar environmental features are grouped into environmental disciplines for characterization and assessment of effects. The ToR includes a description of each environmental discipline listed in **Table 7-1** based on readily available existing information for the general vicinity of the Project. The information included in the ToR will be augmented during the EA by field investigations and studies, Indigenous Knowledge shared, and input from neighbouring Indigenous communities, government agencies and interested persons. The more detailed description of the environment will be provided in the EA.

**Table 7-1: Environmental Components and Disciplines to be Considered during the Environmental Assessment**

Environmental Component	Discipline
<b>Indigenous Peoples' Rights and Interests</b>	<ul style="list-style-type: none"> <li>■ Aboriginal and Treaty Rights and Interests</li> </ul>
<b>Natural (Physical and Biophysical)</b>	<ul style="list-style-type: none"> <li>■ Atmospheric Environment</li> <li>■ Acoustic Environment</li> <li>■ Physiography, Geology<sup>1</sup>, Terrain and Soils</li> <li>■ Surface Water</li> <li>■ Groundwater</li> <li>■ Vegetation</li> <li>■ Wildlife</li> <li>■ Fish and Fish Habitat</li> </ul>
<b>Social, Economic and Built Environment</b>	<ul style="list-style-type: none"> <li>■ Social</li> <li>■ Economy</li> <li>■ Land and Resource Use</li> <li>■ Human Health and Community Safety</li> <li>■ Visual Aesthetics</li> </ul>
<b>Archaeology and Cultural Heritage</b>	<ul style="list-style-type: none"> <li>■ Archaeological Sites and Resources</li> <li>■ Built Heritage Resources and Cultural Heritage Landscapes</li> </ul>

Note: 1. Geology includes geochemistry, bedrock geology and overburden geology.

## 7.1.3 Methods to Characterize the Environment during the Environmental Assessment

The existing environment that may be affected by the Project will be described in greater detail in the EA. Additional information that is planned to be used to further describe the environment within the EA includes, but is not limited to the following:

- Review of available data and information;
- Data collected through field investigations and studies;

- Data obtained through MFFN's Data Sharing Agreements with the MNR (December 2019) and MECP (October and November 2019);
- High resolution imagery obtained from Light Detection and Ranging (LiDAR) data;
- Geographic Information System data analysis;
- Modelling, where applicable;
- Input from government and interested persons;
- Indigenous Knowledge shared by Indigenous communities; and
- Marten Falls First Nation Community Based Land Use planning.

The EA will document the methods and results of field investigations and studies that are completed in support of the EA. Project-specific field investigations and studies will be undertaken for input into the assessment and evaluation of effects of the alternatives and to support other permits and approvals required for the Project (**Section 13**). The field investigations and studies currently planned are summarized in **Section 7.1.4** but may change based on the results of ongoing consultation with neighbouring Indigenous communities, government agencies and interested persons, including the review of the ToR. Generally, the field investigations target the study area defined in **Section 7.1.1**.

#### **7.1.4 Description of the Existing Environment**

The following sections provide a brief description of the existing environment based on readily available data. Information was sourced from:

- records published through secondary sources;
- information shared by the MFFN CBLUP Team;
- previous studies; and
- government agencies.

Indigenous Knowledge is an important information source that must contribute to the characterization of existing environmental conditions, where possible. Given the sensitive nature of Indigenous Knowledge, sharing agreements must be in place prior to the inclusion of such knowledge (**Section 3.4.2.1**). Efforts to finalize Indigenous Knowledge sharing agreements for the Project are ongoing at the time of preparing the ToR. Therefore, Indigenous Knowledge available to characterize the existing conditions is currently limited. However, the description of the existing environment that will be included in the EA will incorporate applicable Indigenous Knowledge provided, where possible. Given that the Project falls primarily in the traditional territory of MFFN (including some areas of shared territory), and the MFFN community has started the CBLUP process, MFFN has an appreciation for highly valued areas as well as where information on the existing environment is lacking and additional investigation is needed. This understanding will guide efforts to collect and share Indigenous Knowledge to characterize the existing environment.

In addition to Indigenous Knowledge, it is expected that non-Indigenous Knowledge information relevant to the Project may be shared by Indigenous communities as consultation and engagement proceeds. Information of this nature and relevant to the Project will also be incorporated into the EA.

The Project is located within the Big Trout Lake Ecoregion within the Ontario Shield Ecozone and the James Bay Ecoregion within the Hudson Bay Lowlands Ecozone. The Ontario Shield Ecozone is characterized largely by forest, followed by treed bogs and fens, open water, and other wetlands. There is an abundance of black spruce (*Picea mariana*) and fire plays an important ecological role in the ecoregion. The Hudson Bay Lowlands Ecozone forms the core of the third largest wetland in the world. This area is characterized largely by treed bogs and fens, followed by forest, other wetlands, and open water. Given the abundance of wet organic substrates and a cool humid climate within the Hudson Bay Lowlands Ecozone, fire plays a less significant role in this area, compared to the Ontario Shield Ecozone.

Marten Falls is located in a northern temperature zone characterized by short warm summers and long cold winters. Air quality and noise levels are affected primarily by natural sources (such as wind, forest cover and occasional forest fires) and to a much lesser extent, by limited development in the general area.

The general area of the Project is dominated by wetlands (e.g., bogs, fens, swamps and marshes) of the Albany River watershed and several of its subwatersheds. Surface water moves generally in a north-easterly direction, towards James Bay. The Albany and Ogoki river systems have both been altered from their original state by hydroelectric development activity in the region between 1943 and 1950 respectively (MFFN 2017).

The fish community composition and use of these waterbodies will vary because of factors such as availability of suitable habitat (spawning, overwintering, rearing, and feeding) and connectivity to other waterbodies. Over 20 species of fish, primarily of cool and cold-water thermal regimes, are known to inhabit the waters in the area.

The area of the Project provides suitable habitat for a variety of small and large mammals, as well as various amphibians, reptiles, birds and insects that are found in the boreal forest. The area is characterized by: i) open and treed wetlands dominated by species such as black spruce, mosses and shrubs; and ii) upland terrestrial habitat comprised of mixed forests with species such as jack pine, white spruce, and several poplar species. These areas also host wildlife species of conservation concern.

Further details are provided in the following sections.

#### 7.1.4.1 *Aboriginal and Treaty Rights and Interests*

##### Aboriginal and Treaty Rights

The Project is located within the James Bay Treaty - Treaty Number 9 (made in 1905 and 1906) and Adhesions made in 1929 and 1930 areas as shown in **Figure 7-2**. Matawa Council, Shibogama Council and Mushkegowuk Council First Nations are included in the Treaty 9 area (Government of Canada 2008). MFFN is a member of the Matawa First Nations Management Inc.

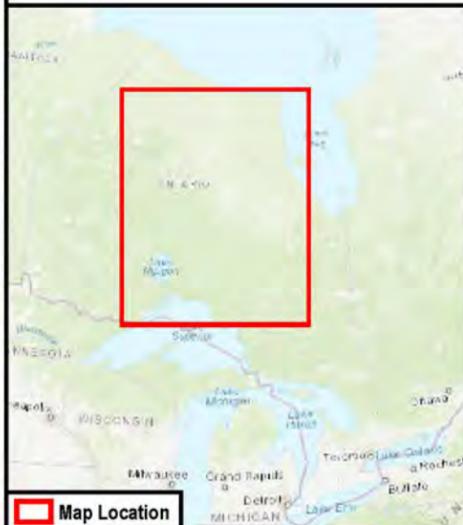
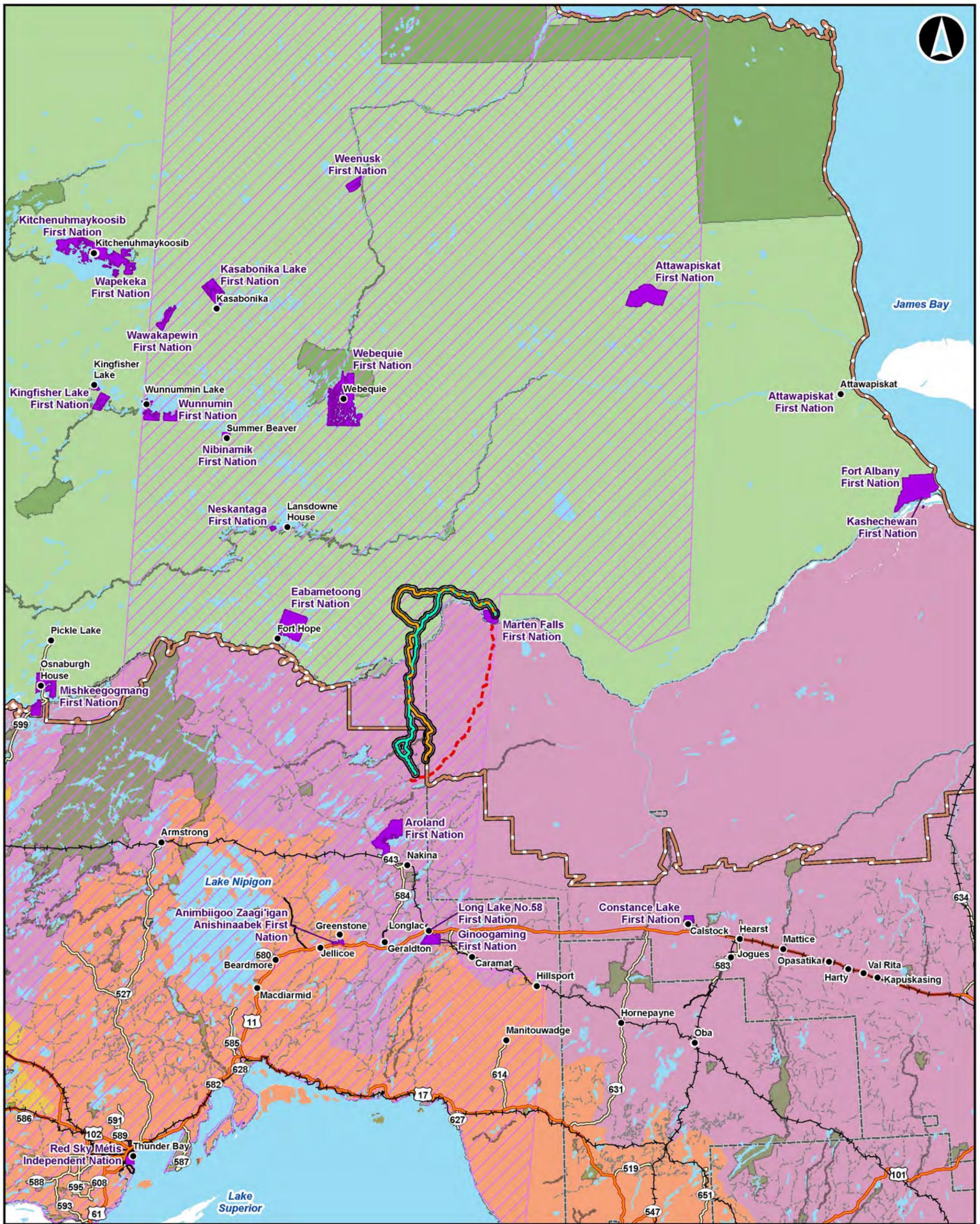
Aboriginal and Treaty Rights are protected under section 35 of the *Constitution Act, 1982*, through which existing Aboriginal and Treaty Rights of Aboriginal peoples<sup>11</sup> in Canada are recognized and affirmed. Aboriginal and Treaty Rights include, but are not limited to, hunting, fishing and gathering, as set out in treaties with the Crown or stemming from practices, customs or traditions that are integral to the distinctive culture of the Aboriginal community claiming the right. The Crown has a Duty to Consult and, where appropriate, accommodate Aboriginal communities when it has actual or constructive knowledge of an established or asserted Aboriginal or Treaty Right and contemplates conduct that may adversely affect that right. Procedural aspects of consultation may be delegated to a third party or proponent. However, the Duty to Consult rests with the Crown.

As part of these rights, the Governments of Canada and Ontario have the Duty to Consult Indigenous communities for this Project. The Province of Ontario (MECP and ENDM) and MFFN entered into an agreement through a Memorandum of Understanding (MOU) to share responsibility of the procedural aspects of Ontario's Duty to Consult, in the context of the EA for the Project. The Marten Falls-Ontario MOU on Shared Consultation Responsibilities was signed on January 7, 2020 and defines the roles and responsibilities of both parties in regard to the consultation of Indigenous communities whose Aboriginal or Treaty Rights may be adversely affected by the Project and interested persons (**Appendix D**).

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11. The term, *Aboriginal*, is used rather than *Indigenous* to reflect the definitions provided in the *Constitution Act, 1982* and specifically s.35 (2), including *Indian, Inuit and Métis* people in Canada.





**Legend**

- Study Area
- Route Alternatives
  - Alternative 1
  - Alternative 4
- Neighbouring Indigenous Communities
  - First Nation Reserve
  - Métis Nation of Ontario, Region 2
- General Features
  - City/Town/Settlement
  - Freeway
  - Highway
  - Major Road
  - Resource / Recreation
  - Railway
  - MFFN Existing Winter Access Road
- Treaty Boundaries
  - Adhesion to Treaty, No. 9, 1929-1930
  - Treaty No. 3, 1873
  - Treaty No. 60, 1850
  - Treaty No. 9, 1905-1906
- Far North Boundary
- District Municipality
- Provincial Park
- Waterbody

**Marten Falls First Nation  
All Season Community Access Road**

**Treaty Boundaries**

0 10 20 40 60 80 100  
Kilometres

Datum: NAD 1983 UTM Zone 16N

Aug, 2020	1:2,500,000	Data Sources: Derived by KBM Resources Group n.d. MNR, MMAH, NRCAN, MLAS
P#:60593122	Rev:00	

**AECOM** **Figure 7-2**

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**Table 7-2** provides brief community profiles for all Indigenous communities that have been identified to be consulted on the Project. MFFN is currently undertaking consultation with these communities (**Section 10**). The consultation will continue throughout the EA as per the interest expressed by each community.

Reserve lands were granted to Indigenous communities in the area of the Project under Treaty 9 (Government of Canada 2008). There is one First Nation Reserve area that will be transected by the Project. The reserve belongs to MFFN. Reserve lands of neighbouring Indigenous communities are located beyond the preliminary study area.

Contrary to the Crown, the Matawa First Nations note:

*“[t]he Cree and Ojibway firmly believed that they signed treaties that afforded them protection and assistance from a benevolent king as well as a land sharing and resource sharing arrangement. The First Nations assert that they never gave up their land or their right to govern themselves. Matawa leaders assert that the act of entering treaty represented recognition of their nationhood. They state that they agreed to oral promises when they signed their treaties, many of which do not find expression in the Treaty text. This treaty understanding is passed down through the Elders in the oral transmission and tradition (Matawa First Nations Management Inc. 2019).”*

Ontario land claims consider land claims related to Indigenous communities’ rights to land and to the use of land. Claims can consider size and location of reserves or improper use of reserve lands by government (Government of Ontario 2019a). Currently, no land claims with the government of Ontario are occurring within the preliminary study area (Government of Ontario 2019b). At the time of preparing the ToR, there are no additional comprehensive or specific federal land claims in the vicinity of the Project, beyond those mentioned in **Table 7-2** under Ginoogaming First Nation and Eabametoong First Nation.

MFFN has initiated a CBLUP with the MNR under the *Far North Act* (Government of Ontario 2014b). The *Far North Act* is the legislative foundation of land use planning for an Indigenous community’s defined planning area of interest in the Far North of Ontario. Far North land use planning is about working with Indigenous communities to identify where development can occur and where land is dedicated to protection in the Far North, which covers 42% of Ontario’s land mass (Government of Ontario 2012). Other communities that have undertaken CBLUP, which may include the area of the Project, are identified in **Table 7-2**. Aroland First Nation and MFFN have undertaken work together to collect Anishinabek Knowledge within the territory they share. The CBLUP process respects the exercise of Aboriginal and Treaty Rights and traditional territory of neighboring Indigenous communities and supports open dialogue to identify neighboring Indigenous community interests and mutually desirable planning outcomes.

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Animbiigoo-Zaagi'igan Anishinaabek First Nation</b> <b>Tribal Council:</b> Nokiwin Tribal Council	<p>Animbiigoo-Zaagi'igan Anishinaabek First Nation (AZA) is signatory to the Robinson-Superior Treaty 1850 and is affiliated with the Nokiwin Tribal Council. The AZA cultural affiliation is Ojibway.</p> <p>There is one AZA reserve, the Lake Nipigon Reserve (1,269.9 ha), which was established in 2008. The Lake Nipigon Reserve is located 236 km southwest of MFFN along the southern shores of Partridge Lake, between Jellicoe and Geraldton. Three registered members live on the Lake Nipigon Reserve and the remaining approximately 500 registered members live elsewhere (ISC 2019), primarily in other Ontario communities including Beardmore, Jellicoe, Geraldton and Thunder Bay.</p> <p>The First Nation has a Custom Electoral Governance System with one Chief and four Councillors elected every three years. AZA's administrative office is located in Beardmore, Ontario (AZA 2019).</p>
<b>Aroland First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Aroland First Nation is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. Aroland First Nation is comprised of an amalgamation of members with ties to Eabametoong First Nation, MFFN, Ginoogaming First Nation, Long Lake #58 First Nation and Fort William First Nations, and with cultural affiliations to Oji-Cree and Ojibway (Aroland First Nation 2019).</p> <p>Aroland Indian Settlement is the primary community for over half of the approximately 700 registered Aroland First Nation members (ISC 2019, Aroland First Nation 2019). The community is located approximately 170 km southwest of MFFN, and approximately 20 km west of Nakina on Hwy 643. According to Indigenous Services Canada (ISC 2019), 22 registered members live on 'own reserve' and the remaining 709 registered members live elsewhere. However, Aroland Indian Settlement is not a reserve and has no statutory basis under the <i>Indian Act</i>.</p> <p>Aroland First Nation has a Custom Electoral Governance System with one Chief and seven Councillors elected every two years. Aroland First Nation is engaged with the Far North Branch of MNR for a CBLUP but is not actively planning.</p>
<b>Attawapiskat First Nation</b> <b>Tribal Council:</b> Mushkegowuk Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Attawapiskat First Nation is a signatory to Treaty 9 and is affiliated with the Mushkegowuk Council and Nishnawbe Aski Nation. Omushkegowuk (people of Attawapiskat) are represented by the Mushkegowuk Council for their Mushkegowuk Aski (traditional territory). The Attawapiskat cultural affiliation is Swampy Cree.</p> <p>Attawapiskat First Nation is comprised of two reserves: Attawapiskat Reserve 91a (235.8 ha), the permanent community, and Attawapiskat Reserve 91 (27,040.1 ha) (ISC 2019). Attawapiskat Reserve 91 is located at the mouth of the Attawapiskat River on James Bay, approximately 278 km northeast of MFFN. Attawapiskat Reserve 91a is located approximately 200 km north of MFFN. The reserves are accessible by air, water and winter road only. As of July 2019, 1,981 members are listed as living on Attawapiskat reserves, with the remaining 1,677 members living elsewhere (ISC 2019).</p> <p>Attawapiskat First Nation has a Custom Electoral Governance System with one Chief, one Deputy Chief and 11 Councillors elected every three years.</p>
<b>Constance Lake First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Constance Lake First Nation is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and the Nishnawbe Aski Nation. The Constance Lake cultural affiliation is Cree and Ojibway.</p> <p>Constance Lake First Nation is comprised of two reserves: Constance Lake 92 Indian Reserve on the Kabinakagami River (3,110.5 ha), which serves as the primary residential community, and English River 66 Reserve on the Kenogami River (3,108 ha) (ISC 2019). The Constance Lake 92 Reserve is located approximately 240 km southeast of MFFN, and the English River 66 Reserve is located 74 km southeast of MFFN. Both of the Constance Lake Reserves are accessible by way of Highway 11. As of July, 2019, 871 of the 1,761 registered members are listed as living on reserve on the Constance Lake 92 Reserve (ISC 2019).</p> <p>Constance Lake First Nation uses the <i>Indian Act</i> Electoral Governance System with one Chief and six Councillors elected every two years.</p> <p>Constance Lake First Nation is actively working on a Draft CBLUP; the Terms of Reference for the plan was approved in 2013.</p>

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Eabametoong First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Eabametoong First Nation is a signatory of Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The Eabametoong cultural affiliation is Ojibway.</p> <p>Eabametoong First Nation is comprised of a single reserve, Fort Hope Reserve 64 (25,900.3 ha) (ISC 2019). Fort Hope 64 is a remote northern community located approximately 360 km north of Thunder Bay. The community is situated on the north shore of Eabamet Lake, approximately 142 km west of MFFN. As of July 2019, approximately 1,500 registered members live on the Fort Hope 64 Reserve, with the remaining approximately 1,167 registered members living elsewhere (ISC 2019), mostly in other parts of northern Ontario. The Reserve is accessible by air, water and winter road only.</p> <p>According to the Federal Reporting Center on Specific Claims (Government of Canada 2020), there is one active claim by Eabametoong First Nation related to unfulfilled Treaty Land Entitlement pursuant to Treaty 9.</p> <p>Eabametoong First Nation uses the <i>Indian Act</i> Electoral Governance System with one Chief and five Councillors elected every two years.</p> <p>Eabametoong First Nation has been working on a Draft CBLUP; the Terms of Reference was approved in 2013. While not actively planning, Eabametoong First Nation works with Mishkeegogamang First Nation on a joint plan when active.</p>
<b>Fort Albany First Nation</b> <b>Tribal Council:</b> Mushkegowuk Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Fort Albany First Nation is a signatory to Treaty 9 and is affiliated with the Mushkegowuk Council and the Nishnawbe Aski Nation. Prior to 1965, the community was referred to as Peetabeck Inninowuk. The Fort Albany cultural affiliation is Mushkegowuk Cree.</p> <p>Omushkegowak (people of Fort Albany) lived off their paquataskamik (traditional territory) until they were relocated to the Fort Albany 67 Reserve. The community originated as a Hudson's Bay Company trading post. In the 1950s, the Fort Albany 67 Reserve divided into two communities (Fort Albany First Nation and Kashechewan First Nation) due to religious differences (Five Nations 2012).</p> <p>The Fort Albany 67 Reserve (36,345.7 ha) is unique in that there are two First Nations residing on the land (Fort Albany First Nation and Kashechewan First Nation) (ISC 2019). Fort Albany 67 is located approximately 300 km northeast of MFFN, with Fort Albany First Nation members residing on the south bank of the Albany River approximately 15 km upstream from James Bay (Five Nations 2012). It is accessible by air, water and winter road only.</p> <p>The combined total of registered member population of Fort Albany First Nation and Kashechewan First Nation is 5,211 members and is mutually referred to as 'Albany' in the Indigenous Services Canada First Nation Profile (ISC 2019). As of July 2019, 3,226 registered members of Fort Albany First Nation and Kashechewan First Nation reside on Fort Albany 67 with the remaining 1,985 registered members living elsewhere (ISC 2019).</p> <p>Fort Albany First Nation has a Custom Electoral Governance System with one Chief, one Deputy Chief and seven Councillors elected every two years.</p>

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Ginoogaming First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Ginoogaming First Nation, formerly known as Long Lake 77, is a signatory of Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The Ginoogaming cultural affiliation is Ojibway and Oji-Cree.</p> <p>Ginoogaming First Nation is comprised of one reserve, Ginoogaming (6,978 ha), located on the northern shore of Long Lake (ISC 2019), 2 km south of Longlac and approximately 210 km southwest of MFFN. The community is accessible by road (Highway 1), air, rail and water. As of July 2019, 210 registered members reside on Ginoogaming First Nation, with 775 registered members residing elsewhere (ISC 2019).</p> <p>According to the Federal Reporting Centre on Specific Claims (Government of Canada 2020), there are two active claims by Ginoogaming First Nation. One of the claims is related to alleged breaches of fiduciary obligations with respect to the construction of Tote Road through the Reserve. The second is related to unfulfilled Treaty Land Entitlement pursuant to Treaty 9, with negotiations involving 7,296 acre of land and areas of interest including residential, economic and cultural uses (Ginoogaming First Nation 2019).</p> <p>Ginoogaming First Nation uses the <i>Indian Act</i> Electoral Governance System with one Chief and six Councillors elected every two years.</p>
<b>Kasabonika Lake First Nation</b> <b>Tribal Council:</b> Shibogama First Nations Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Kasabonika Lake First Nation is a signatory to Treaty 9 and is affiliated with the Shibogama First Nations Council and Nishnawbe Aski Nation. The Kasabonika Lake cultural affiliation is Oji-Cree.</p> <p>Kasabonika Lake First Nation is comprised of one reserve, Kasabonika Lake Reserve (10,806.5 ha) located along the Ashweig River (ISC 2019), approximately 450 km northeast of Sioux Lookout and approximately 277 km northwest of MFFN. It is accessible by air, water and winter road only. As of July 2019, there are 1,097 registered members residing on the Kasabonika Lake Reserve with the remaining 92 members living elsewhere (ISC 2019).</p> <p>Kasabonika Lake has a Custom Electoral Governance System with one Chief, one Deputy Chief, one Head Councillor and four Councillors elected every two years.</p>
<b>Kashechewan First Nation</b> <b>Tribal Council:</b> Mushkegowuk Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Kashechewan First Nation is not a signatory to Treaty 9, but it is affiliated with the Mushkegowuk Council and Nishnawbe Aski Nation. Omushkegowuk (people of Kashechewan) are represented by the Mushkegowuk Council for their Mushkegowuk Aski (traditional territory). The Kashechewan cultural affiliation is Cree.</p> <p>The community originated as a Hudson’s Bay Company trading post. Prior to 1950, Kashechewan members were part of the Fort Albany First Nation (Five Nations 2012). During the 1950s, the Fort Albany 67 Reserve divided into two communities (Kashechewan First Nation and Fort Albany First Nation) due to religious differences (Five Nations 2012). The Fort Albany 67 reserve (36,345.7 ha) is shared by both Fort Albany First Nation and Kashechewan First Nation (ISC 2019), and is located approximately 300 km northeast of MFFN. It is accessible by air, water and winter road only.</p> <p>The combined total registered member population of Kashechewan First Nation and Fort Albany First Nation is 5,211 members and is mutually referred to as ‘Albany’ in the Indigenous Services Canada First Nation Profile (ISC 2019). As of July 2019, 3,226 registered members of Kashechewan First Nation and Fort Albany First Nation reside on Fort Albany 67, with the remaining 1,985 registered members living elsewhere (ISC 2019).</p> <p>Kashechewan First Nation has a Custom Governance System with one Chief, one Deputy Chief and 9 Councillors elected every four years. Kashechewan First Nation approved a Terms of Reference for a CBLUP in 2017, however, the community is not actively planning.</p>

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Kingfisher Lake First Nation</b> <b>Tribal Council:</b> Shibogama First Nations Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Kingfisher Lake First Nation is a signatory to Treaty 9 and is affiliated with the Shibogama First Nations Council and Nishnawbe Aski Nation. The Kingfisher Lake cultural affiliation is Oji-Cree.</p> <p>Kingfisher Lake First Nation is comprised of three reserves: Kingfisher 2A (5,444.7 ha), Kingfisher 3A (921.9 ha), and Kingfisher Lake 1 (596 ha) (ISC 2019). The Kingfisher Lake 1 Reserve is the most populated of the three. It is located on the south shore of Kingfisher Lake, approximately 360 km northeast of Sioux Lookout (which is the nearest service centre) and approximately 306 km northwest of MFFN. The reserves are accessible by air, water and winter road only. As of July 2019, 557 of the 621 total registered members reside on reserve, with the remaining registered members living elsewhere (ISC 2019). Kingfisher Lake First Nation has a custom Electoral Governance System with one Chief, one Deputy Chief, one Head Councillor and three Councillors elected every two years.</p>
<b>Kitchenuhmaykoosib Inninuwug First Nation</b> <b>Tribal Council:</b> Independent First Nations Alliance	<p>Kitchenuhmaykoosib Inninuwug First Nation is a signatory to Treaty 9 and is affiliated with the Independent First Nations Alliance and Independent First Nation. The Kitchenuhmaykoosib cultural affiliation is Oji-Cree specifically, Anishiniimowin, Severn Cree and Northern Ojibway.</p> <p>Kitchenuhmaykoosib Inninuwug First Nation is comprised of a single reserve, Kitchenuhmaykoosib Aaki 84 (29,937.6 ha) on the north shore of Big Trout Lake (ISC 2019), located approximately 440 km northeast of Sioux Lookout and 361 km northwest of MFFN. It is accessible by air, water and winter road only. As of July 2019, 1,159 registered members reside on the Kitchenuhmaykoosib Aaki Reserve, with the remaining 553 registered members residing elsewhere (ISC 2019). Kitchenuhmaykoosib Inninuwug First Nation has a Custom Electoral Governance System with one Chief, one Deputy Chief, and six Councillors elected every two years.</p>
<b>Long Lake #58 First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Long Lake #58 First Nation is a signatory to the Robinson-Superior Treaty 1850 and is affiliated with Matawa First Nations Management Inc., the Nishnawbe Aski Nation and the Union of Ontario Indians (UOI). The Long Lake #58 cultural affiliation is Ojibway.</p> <p>Long Lake #58 First Nation is comprised of a single reserve, Long Lake 58 (232.3 ha) located on the northern shore of Long Lake (ISC 2019), approximately 35 km northeast of Geraldton and approximately 207 km southwest of MFFN. As of July 2019, 528 registered members reside on Long Lake 58, with 1,115 registered members residing elsewhere (ISC 2019).</p> <p>Long Lake #58 First Nation uses the <i>Indian Act</i> Electoral Governance System with one Chief and 11 Councillors elected every two years.</p>
<b>Marten Falls First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>MFFN is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The MFFN cultural affiliation is Ojibway.</p> <p>MFFN is comprised of one reserve, Marten Falls Reserve 65 (7770.1 ha) on the Hudson Bay Lowlands in Northern Ontario (ISC 2020), at the intersection of the Ogoki and Albany rivers and approximately 400 km north of Thunder Bay. It is currently accessible by air, water and winter road only. The closest city with year-long road access is Nakina, which is located approximately 160 km to the south. As of April 2020, there are 352 registered members residing on the Marten Falls Reserve, with the remaining 462 registered members living elsewhere (ISC 2020).</p> <p>MFFN uses the <i>Indian Act</i> Electoral Governance System with one Chief and seven Councillors elected every two years.</p> <p>MFFN is actively working on a Draft CBLUP; the Terms of Reference for the plan was approved in 2013.</p>

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Métis Nation of Ontario, Region 2</b>	<p>The Métis Nation of Ontario (MNO) was established in 1993 to represent communities that are a part of the Métis Nation (MNO 2019). Today there are over 20,000 registered Métis citizens and approximately 30 Chartered Community Councils across Ontario that represent Métis citizens at the local level.</p> <p>Through the MNO, Ontario Métis have established a governance structure that represents the Métis citizens and rights-bearing Métis communities at the local, regional and provincial levels. The Greenstone Métis Council forms a part of this governance structure as a local level council based out of Geraldton. Geraldton is located approximately 230 km southwest of MFFN.</p> <p>The MNO has a provincial governing body that is elected every four years. The MNO hosts an Annual General Assembly where regional and provincial Métis leaders are required to report back to Métis citizens yearly between elections. The MNO also maintains a charitable foundation, the Métis Nation of Ontario Cultural Commission, which promotes and supports Métis culture and heritage and an economic development arm, the Métis Nation of Ontario Development Corporation (MNO 2019).</p>
<b>Mishkeegogamang First Nation</b> <i>Tribal Council: Independent First Nations</i> <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Mishkeegogamang First Nation is a signatory to Treaty 9 and affiliated with Nishnawbe Aski Nation. The Mishkeegogamang cultural affiliation is Ojibway.</p> <p>The Mishkeegogamang First Nation is comprised of two reserves: 63A (5,018.6 ha) and 63B (13,677.8 ha). As of April 2020, there are 1,111 registered members residing on Reserves 63A and 63B, with the remaining 866 registered members living elsewhere (ISC 2020).</p> <p>Mishkeegogamang First Nation uses the <i>Indian Act</i> Electoral System with one Chief and five Councillors elected every two years.</p>
<b>Neskantaga First Nation</b> <i>Tribal Council: Matawa First Nations Management Inc.</i> <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Neskantaga First Nation is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The Neskantaga cultural affiliation is Ojibway and Oji-Cree.</p> <p>Neskantaga First Nation is comprised of one reserve, Neskantaga Reserve (831.5 ha) located on Attawapiskat Lake (ISC 2019), approximately 200 km north of Nakina (Municipality of Greenstone) and 180 km northeast of Pickle Lake and 157 km northwest of MFFN. It is accessible by air, water and winter road only. As of July 2019, there are 355 registered members residing on the Neskantaga Reserve with the remaining 137 registered members living elsewhere (ISC 2019). Neskantaga First Nation has a Custom Electoral System with one Chief and four Councillors elected every two years.</p>
<b>Nibinamik First Nation</b> <i>Tribal Council: Matawa First Nations Management Inc.</i> <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Nibinamik First Nation, known as the Summer Beaver, is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The Nibinamik cultural affiliation is Ojibway.</p> <p>Nibinamik First Nation is comprised of the recently recognized reserve of the Summer Beaver Settlement, which is located on Nibinamik Lake (ISC 2019). The community is located approximately 480 km north of Greenstone and approximately 215 km northwest of MFFN. It is accessible by air, water and winter road only. According to Indigenous Services Canada (ISC 2019), 67 registered members live on 'own reserve' and the remaining 476 registered members live elsewhere. However, the Summer Beaver Settlement is not a reserve and has no statutory basis under the <i>Indian Act</i>. Nibinamik First Nation has a Custom Electoral Governance System with one Chief, one Head Councillor and three Councillors elected every two years.</p>
<b>Red Sky Métis Independent Nation</b>	<p>Red Sky Métis Independent Nation (RSMIN) is comprised of descendants of the 84 Métis who were beneficiaries and annuitants under the Robinson-Superior Treaty 1850. As of August 2014, RSMIN is recognized as a non-status Nation (RSMIN 2019). The administrative office for Red Sky Métis Independent Nation is located in Thunder Bay, approximately 435 km southwest of MFFN. There are approximately 8,000 members with an elected Chief (RSMIN 2019).</p>

**Table 7-2: Community Profiles of Neighbouring Indigenous Communities**

Indigenous Community	Community Profile
<b>Wapekeka First Nation</b> <b>Tribal Council:</b> Shibogama First Nations Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Wapekeka First Nation is a signatory to Treaty 9 and is affiliated with the Shibogama First Nations Council and Nishnawbe Aski Nation. Wapekeka was formerly known as the Angling Lake First Nation. The Wapekeka cultural affiliation is Oji-Cree. Wapekeka First Nation is comprised of two reserves: Wapekeka Reserve 1 (3,605 ha) and Wapekeka Reserve 2 (2,026.5 ha) (ISC 2019). Wapekeka Reserve 2 serves as the residential community and is located on the shores of Otter Lake, approximately 440 km northeast of Sioux Lookout, which is the nearest service centre, and 350 km northwest of MFFN. Wapekeka Reserve 1 is located approximately 10 km south of the main community. The community is accessible by air through the off-reserve Angling Lake / Wapekeka Airport, as well as partially accessible by boat and a winter road. As of July 2019, 458 of the 498 registered members reside on Wapekeka reserve lands, with the remaining residing elsewhere (ISC 2019). Wapekeka First Nation has a Custom Electoral Governance System with one Chief, one Deputy Chief, and three Councillors elected every two years.</p>
<b>Wawakapewin First Nation</b> <b>Tribal Council:</b> Shibogama First Nations Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Wawakapewin First Nation is a signatory to Treaty 9 and is affiliated with the Shibogama First Nations Council and Nishnawbe Aski Nation. The Wawakapewin cultural affiliation is Oji-Cree. Wawakapewin First Nation is comprised of one reserve, the Wawakapewin Reserve (5,221 ha) (ISC 2019), which is located approximately 300 km northwest of MFFN. As of July 2019, approximately half of the 74 registered members reside on the Wawakapewin Reserve, with the remaining registered members residing elsewhere (ISC 2019). Wawakapewin First Nation has a Custom Electoral Governance System with one Chief and one Councillor elected every three years. Wawakapewin First Nation approved a Terms of Reference for a CBLUP in 2014, however, the community is not actively planning.</p>
<b>Webequie First Nation</b> <b>Tribal Council:</b> Matawa First Nations Management Inc. <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Webequie First Nation is a signatory to Treaty 9 and is affiliated with Matawa First Nations Management Inc. and Nishnawbe Aski Nation. The Webequie cultural affiliation is Oji-Cree. Webequie First Nation is comprised of one reserve, Webequie Reserve (34,279 ha), located on the northern peninsula of Eastwood Island on Winisk Lake (ISC 2019), approximately 540 km north of the city of Thunder Bay and 178 km northwest of MFFN. The community is accessible by air via the off-reserve remote Webequie Airport, by water and winter road. As of July 2019, 331 of the registered members reside on the Webequie Reserve while the remaining 612 registered members live elsewhere (ISC 2019).</p> <p>Webequie First Nation has a Custom Electoral System with one Chief, one Head Councillor and five Councillors elected every two years. Webequie First Nation is actively working on a Draft CBLUP; the Terms of Reference for the plan was approved in 2014.</p>
<b>Weenusk First Nation</b> <b>Tribal Council:</b> Independent First Nations <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Weenusk First Nation is a signatory to Treaty 9 and is affiliated with Nishnawbe Aski Nation. The Weenusk First Nation cultural affiliation is Cree in the n-dialect. Anishiniimowin and Ojibwemowin are also spoken.</p> <p>Weenusk people used to live in the community of Winisk near the mouth of the Winisk River until the community moved to Peawanuck due to flooding. Peawanuck is located near the confluence of the Winisk and Shamattawa Rivers, approximately 30 km up river from Winisk. Weenusk First Nation is comprised of one reserve, Winisk Reserve 90 (5,310 ha), and the Winisk Indian Settlement (ISC 2019), both of which are located approximately 45 km from Hudson Bay along the Winisk River and approximately 375 km north of MFFN. As of July 2019, 21 registered members live on Winisk Reserve 90 while the majority of the 600 registered members live elsewhere (ISC 2019). Weenusk First Nation has a Custom Electoral Governance System with one Chief and three Councillors elected every two years. Weenusk First Nation approved a Terms of Reference for a CBLUP in 2017, however, the community is not actively planning.</p>
<b>Wunnumin Lake First Nation</b> <b>Tribal Council:</b> Shibogama First Nations Council <b>Provincial Territorial Organization:</b> Nishnawbe Aski Nation	<p>Wunnumin Lake First Nation is a signatory to Treaty 9 and is affiliated with the Shibogama First Nations Council and Nishnawbe Aski Nation. The Wunnumin cultural affiliation is Oji-Cree. Wunnumin Lake First Nation is comprised of two reserves, Wunnumin 1 (5,855.1 ha) and Wunnumin 2 (3,794.4 ha) (ISC 2019). The reserves are located approximately 385 km northeast of Sioux Lookout, 177 km northeast of Pickle Lake, and 270 km northwest of MFFN. The community is accessible by air through the off-reserve remote Wunnumin Lake Airport, by water, and by winter road. As of July 2019, 574 of the 712 registered members reside on the Wunnumin reserves, with the remaining registered members living elsewhere (ISC 2019). Wunnumin Lake First Nation has a Custom Electoral System with one Chief, one Deputy Chief, one Head Councillor and three Councillors elected every two years.</p>

### Indigenous Use of Land and Resources for Traditional Purposes

The Project is located within the traditional territory of First Nations, including MFFN. “[MFFN’s] traditional territory extends from Little Current River and Ogoki Lake in the south, Makokibaton Lake in the west, Jasper Lake and Muketei Rivers to the north and the Albany Forks to the east” (MFFN 2014). The traditional territory has been used by Indigenous People for trapping, hunting, trade and socializing preceding European contact (MFFN 2014).

Common land use activities include resource harvesting and the exercise of Aboriginal and Treaty Rights as protected under s. 35 of the *Constitution Act, 1982*. Common harvesting activities undertaken by Indigenous communities in the area of the Project include: hunting, fishing, trapping and gathering. These activities may take place throughout the year and are not bound by the provincial harvest seasons and regulations. Ecologically important areas, such as moose calving areas or fish spawning areas, are important to traditional land and resource use due to their role in producing the harvested resources. These harvested resources may also be used for cultural practices.

Transportation pathways and features may be used to support traditional use of the land. Trails and paths within the area of the Project may be used to access hunting, trapping, fishing and gathering areas by Indigenous community members within and beyond the area of the Project. Trails may be accessed on foot, using all-terrain vehicles, trucks or snowmobiles depending on the physical characteristics of the trail and season. In addition, waterways are used as linear access features to travel between harvest areas and other communities. The Albany River is an important waterway due to its frequent use by MFFN and other communities.

Specific sites such as cabins and camps may also be used to contribute to resource harvesting. These features are likely connected to communities by transportation features. Camps and cabins may provide locations important for resource harvesting or travel throughout and beyond the traditional territory. For example, trappers will often have a trapping cabin used for servicing their trapline.

MFFN will work with Indigenous communities to collect and incorporate information on Indigenous uses of lands and resources in relation to the area of the Project through the Indigenous Knowledge Program, including Project-specific Indigenous Knowledge and Land and Resource Use Studies (**Section 3.4.2.1**).

### Indigenous Cultural Sites, Features and Practices

Communities identifying traditional territory within the area of the Project, including MFFN, may have known and unknown cultural sites. Cultural sites include land uses such as ceremonial, grave, sacred, gathering and worship areas. Linear features such as trails and waterways are used by Indigenous Peoples to access cultural sites within and beyond the area of the Project.

Indigenous cultural landscape features such as Place Names, Boundary Markers and Orientation Points contribute to the orientation of Indigenous Peoples on the land. Natural Boundary markers such as rivers or mountains indicated to Indigenous Peoples which territory they were passing through (Manuel 2019).

Cultural activities and practices may occur at specific sites or may be independent of a specific location. The traditional use of the land and socio-community characteristics of the Indigenous communities, including MFFN, facilitates cultural practices in the area of the Project. Cultural practices that are not associated with a specific site are practices that can be undertaken anywhere with other members of the community and facilitate community well-being and cultural strength. These cultural practices may include crafting, language and food consumption.

Cultural practices also refers to cultural activities and events that may occur in a community during specific periods. Some of these cultural activities and events may be associated with specific sites. Within the MFFN community, a

community feast and a pow-wow are held annually (MFFN 2014). Information shared through the community based land use planning process indicates that a cultural week break is taken by school children and most community employees in April, and a youth retreat is held each July where traditional activities and way of life are practiced with young people. These activities are important to the health and well-being of individuals and communities having cultural and spiritual significance. Cultural activities may also interact closely with traditional harvesting including large hunting or fishing events. The social value of these events is important to the sense of community within many Indigenous communities.

MFFN will work with Indigenous communities to collect and incorporate information on cultural sites, features and practices in relation to the area of the Project through the Indigenous Knowledge Program, including Project-specific Indigenous Knowledge and Indigenous Land and Resource Use Studies (**Section 3.4.2.1**).

#### 7.1.4.2 Atmospheric Environment

Marten Falls is located in a northern temperature zone characterized by short warm summers and long cold winters. The nearest Environment Canada weather station is in Geraldton, Ontario, approximately 200 km away. Climate Normals at this station (Climate ID No. 6042716) include data from 1981 to 2010. Average monthly temperatures between 1967 and 2015 at the Geraldton, Ontario weather station were 15.2 degrees Celsius during summer and -16.2 degrees Celsius during winter. Average monthly precipitation in the winter was 38.9 mm and in the summer was 89 mm (Government of Canada 2019).<sup>12</sup>

Existing air quality conditions are determined by both regional and local source influences. Regional air quality is affected mainly by a combination of long-range pollutant transport and meteorological conditions. With the exception of emissions related to point sources such as vehicles, wood or fuel burning furnaces, and diesel generators at MFFN, local air quality influences are similar to regional influences.

Limited information on local air quality is available to characterize the study area and surrounding region. Therefore, the Project will undertake an atmospheric environment field program to better understand the existing local and regional air quality. A one-year air quality monitoring program is planned that will measure the compounds most commonly associated with roadway emissions, including the following constituents:

- nitrogen oxides (NO<sub>x</sub>);
- particulate matter (e.g., PM<sub>2.5</sub>, PM<sub>10</sub>, total suspended particulate);
- carbon monoxide (CO);
- sulphur dioxide (SO<sub>2</sub>); and
- and total benzene, toluene, ethylbenzene, and xylene (BTX).

Provincial MECP air quality standards (Government of Ontario 2019d), Ontario Ambient Air Quality Criteria (MECP 2018) and Canadian Ambient Air Quality (CCME 2014) Standards provide acceptable values for air pollutants both provincially and federally based on health and other risk assessments. The measured air pollutant levels can be assessed using these values to determine potential existing air quality issues.

The proposed field investigation was developed to collect data that will allow for the assessment of effects to be conducted following guidance from MECP and the *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects* (MTO 2012) document.

Baseline GHG emissions within the area of the Project from existing activities, such as air travel, will be quantified. Desktop information regarding the extent that peatlands and other landcover types that are within the study area

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12. Note that data between 1967 and 2015 is sourced from both the Geraldton and the Geraldton A weather stations.

act as carbon sinks will also be compiled. Existing air quality conditions will also integrate applicable information obtained through the Indigenous Knowledge Program, where possible.

#### 7.1.4.3 Acoustic Environment

Noise sources in the area of the Project are ambient, natural noises of wildlife present in the forest and vegetated areas that surround the Project. The sources of vibration across the study area would be concentrated in populated areas and would be considered minor and infrequent. A majority of the lands are traditionally used for hunting, fishing, trapping and canoeing. Industrial and transportation noise and vibration sources are limited within the study area. There is no commercial forestry or large industrial activities within much of the area surrounding the Project. The exception would be that of the Ogoki and Kenogami forests that include active commercial forestry operations, which are located along the southern border of the study area and a considerable distance from MFFN. Current access to the area is limited and transportation activities likely have little influence on existing ambient sound and vibration levels.

The expected existing ambient sound levels are not anticipated to exceed the MECP sound level limit of 40 A-weighted decibels (dBA) for outdoor locations in rural areas (Government of Ontario 2013a). Based on this information, existing ambient sound levels of 30 to 40 dBA may occur in the area of the Project and are mainly due to wildlife and other natural sources (e.g., rustling vegetation).

Limited information is available to characterize noise and vibration levels within and surrounding the study area. Therefore, the Project will undertake a field program to better understand the existing local and regional ambient noise levels. Noise measurement and monitoring will be completed in general accordance with guidelines provided by the MECP including the methodology outlined in NPC 300 *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning* (NPC 300), and internationally-recognized standards issued by the International Standards Organization (ISO). Baseline vibration levels will be determined based on available information. In addition, the existing conditions of the acoustic environment will integrate applicable information obtained through the Indigenous Knowledge Program, where possible.

The monitoring program is planned to include monitoring at locations considered to be representative of the different types of points of reception where human activity is expected to occur. 'Representative' monitoring sites will be selected to document ambient noise levels at existing or potential sensitive receptors and will generally follow the definition of noise sensitive receptors in MECP's (formerly Ministry of the Environment, and Climate Change [MOECC]) *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning NPC-300* (MOECC 2013). Sensitive receptors may include occupied residences or areas identified by the Indigenous communities as culturally-significant sites that may be sensitive to noise disturbances, or other areas within the study area, including vacant lots, that could accommodate the construction of sensitive land uses (such as permanent or temporary residences).

Monitoring will be conducted using sound level meters set to record one-hour equivalent noise level (Leq) and noise level exceeding 90% of measurement period (L90). The sound level meters will record monitoring data over a period of 72 hours through unattended monitoring to document noise levels. Data will be screened to remove any abnormal noise events (e.g., birds or insects close to microphone) as well as noise data collected under unfavourable weather conditions (i.e., periods of precipitation and wind speeds exceeding 20 km / h). The daytime (7:00 to 19:00) and night-time (19:00 to 7:00) ambient noise levels will be calculated. During installation (and retrieval) of noise monitoring equipment, attended noise measurements will be taken to supplement the monitoring data.

#### 7.1.4.4 *Physiography, Geology, Terrain and Soils*

The Project lies within the Hudson Bay Lowlands physiographic region, which is characterized by low lying, poorly drained terrain dominated by muskeg and bog. The thickness and distribution of unconsolidated (Quaternary) sediments are the result of extensive glacial activity which took place during the Great Ice Age (Pleistocene Epoch). This period was marked by the advance and retreat of massive, continental ice sheets. During the latter part of the Pleistocene (Late Wisconsinan Substage), the ice mass advanced, depositing till ground moraine. As the ice sheet stagnated, major sand and gravel deposits were laid down, including eskers and ice-contact deposits. Post-glacial erosional and depositional processes have been of relatively minor importance in modifying the physiography of the area (Ontario Geological Survey 1984). Glacial features such as eskers, moraines and drumlins deposits are common in the western areas of the Project.

Marten Falls is underlain by organic deposits (peat, muck and marl). MECP water well records near MFFN suggest that sand and gravel fluvial deposits range from 6 m to over 40 m in thickness. The surficial overburden geology across northern and eastern portions of the study area away from MFFN comprise mainly organic deposits (peat, muck and marl) with isolated occurrences of undifferentiated till. The till in the area is characterized as a matrix of sand to silty sand that is commonly high in clasts and low total matrix carbonate content. Instances of this till material also are identified within the southwest and southern portions of the study area.

A second, finer-grained undifferentiated till occurs along the western and southern portions of the study area. This till material is comprised of a matrix of silty clay to silt that is typically clast poor and high in matrix carbonate content. The till occurs as a discontinuous veneer atop the bedrock surface, with instances of exposed rock occurring frequently throughout the area.

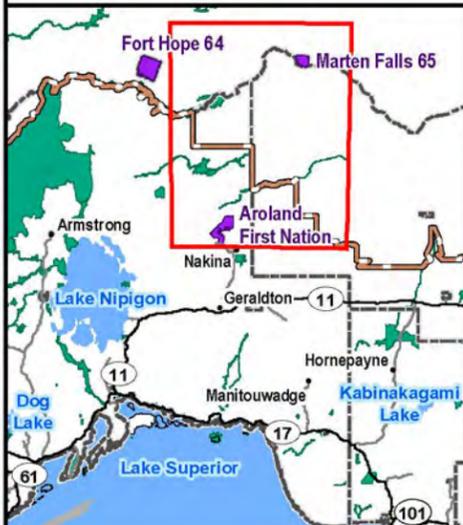
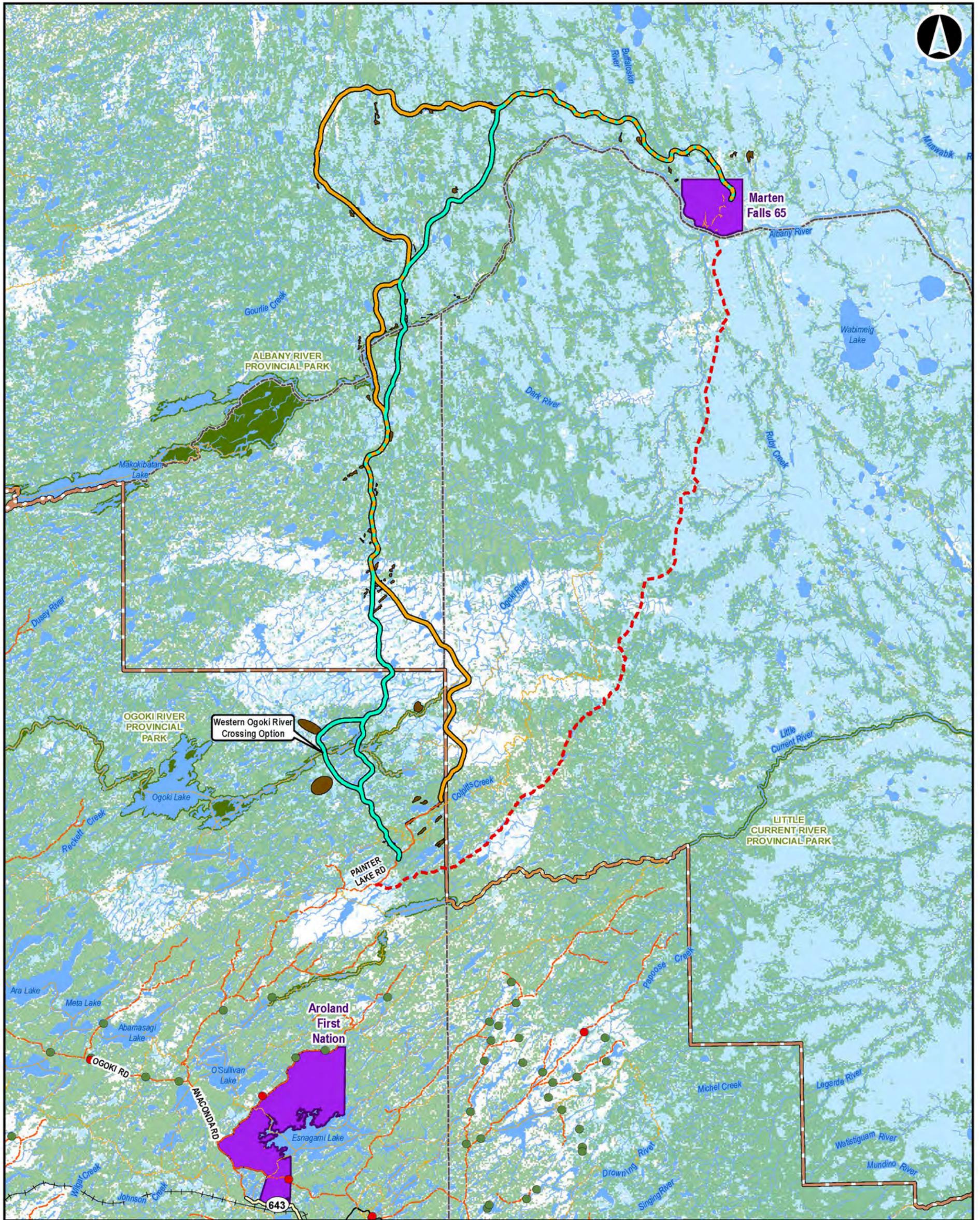
In the southwestern portion of the study area, instances of glaciolacustrine deposits are noted as being representative of nearshore and beach deposits. Given their higher energy depositional processes, the deposits are coarser-grained, comprising of sand, gravelly sand and gravel.

Under the Canadian System of Soil Classification, where topsoil is present, Podzolic and Brunisolic soils are the dominant types within the area of the Project. Podzolic soils are acidic with a B horizon containing accumulations of amorphous materials composed of humified organic matter associated with aluminum and iron. They develop most commonly in sandy materials in areas of cold, humid climate under forest or shrub vegetation. Water moving downward through the relatively porous material leaches out basic elements (e.g., calcium), and acidic conditions develop. Soluble organic substances formed by decomposition of the forest litter attack soil minerals in surface horizons, and much of the iron and aluminum released combines with this organic material. Brunisolic soils include soils that do not quite meet the criteria of the other forested soil orders. Brunisolic soils can be viewed as a stage in an evolutionary sequence that begins with an unweathered parent material (Regosolic soils) and ends with development of a mature forested soil of the Podzolic or Luvisolic orders (Agriculture and Agri-Food Canada 1998).

Bedrock geology in the area of MFFN is comprised of Upper Ordovician aged shale, limestone, dolostone and / or siltstone of the Red Head Rapids Formation and Churchill River Group. Comparatively, the other portions of the study area are underlain by various bedrock types of Proterozoic and Archean age. Rock types within this area include mafic / ultramafic to intermediate metavolcanic rocks, metasedimentary rocks, foliated tonalite, gneissic tonalite, and massive granodiorite to granite. Mafic, ultramafic and related intrusive rocks (diabase dikes) of the Mackenzie swarm, Marathon swarm, Matachewan and Hearst swarms are also reported within the area (MNDM 2017a, MNDM 2017b).

**Figure 7-3** presents potential aggregate sources in the study area. The development of the identification and preliminary investigation of aggregate sources is currently being compiled. Once documented, this information to inform the quality, suitability, chemical composition, availability and quantity of aggregate required for the Project.





**Legend**

<b>Route Alternatives</b>	MFFN Existing Winter Access Road	Existing Aggregate Pit (Active)
Alternative 1	Watercourse	Existing Aggregate Pit (Inactive)
Alternative 4	First Nation Reserve	
<b>General Features</b>	Far North Boundary	
Highway	District Municipality	
Collector Road	Provincial Park	
Residential Road	Woodlands	
Resource Road	Waterbody	
Railway	Wetlands	
Trail	Potential Aggregate Sources *	

**Note:**  
\*Aggregate sources used for the CAR will be a minimum of 100 metres from waterbodies.

**Marten Falls First Nation  
All Season Community Access Road**

**Potential Aggregate Sources**

0 5 10 20 30  
Kilometres

Datum: NAD 1983 UTM Zone 16N

Aug, 2020	1:600,000 * when printed 11"x17"	Data Sources: Derived by KBM Resources Group n.d. MNR, MMAH, NRCA, MLAS, KGS
P#: 60593122	Rev.00	

**AECOM** **Figure 7-3**

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Geotechnical engineering field work will include selective hand augering and peat probes to explore and confirm soil and rock stratigraphy, drilled boreholes and sampling for material testing at selected locations, visual assessment of major water crossing defined as crossing having a width of greater than 10 m, and site visits to potential bedrock quarry sites. The test hole drilling program will be mainly focused on investigating specific geological features that could be developed as potential borrow sources, and to verify geotechnical conditions in key areas, such as major water crossings. During site visits of potential bedrock quarry sites, the bedrock feature will be characterized with respect to rock classification, relative size and relief of the feature, and accessibility to the proposed road alignment. Samples of the bedrock will be obtained, and photographs of the feature will be taken to assess the suitability for quarry development.

The need for and scope of additional surveys will be determined in consultation with applicable agencies. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible.

#### 7.1.4.5 Surface Water

The Project is located within the Hudson Bay Plains and Boreal Shield Ecozones, including areas of transition between the two (Natural Resources Canada 2019) and the James Bay drainage basin. Surface water moves generally in a north-easterly direction, towards James Bay.

The Project lies within two main watersheds: the Upper Albany – Makokibatan and the Lower Ogoki. The primary watercourses within the respective watersheds are the Albany River and Ogoki River. The confluence of these two rivers is located near MFFN. The Albany River is tied for the longest river in Ontario at 982 km long and ultimately discharges into James Bay. The Albany and Ogoki river systems have both been altered from their original state by hydroelectric development activity in the region (MFFN 2017). **Table 7-3** summarizes the estimated number of major (i.e., requiring a long-span bridge construction) and minor (i.e., may require short-span bridge or culvert) crossings of the alternative routes. The location of crossings was identified through background review, helicopter reconnaissance and review of aerial imagery.

**Table 7-3: Estimated Number of Culvert and Bridge Watercourse Crossings**

Description	Alternative 1	Alternative 4
<b>Major Crossings (i.e., long-span bridges)</b>	3	3
<b>Minor Crossings (i.e., short-span bridges and culverts)</b>	43	44
<b>Total Crossings<sup>1</sup></b>	46	47

*Note: 1. The total number of watercourse crossing may change as design progresses and information becomes available to inform the number flow equalization culverts needed in wetlands and other low-lying areas.*

In addition to the Albany River and Ogoki River, numerous streams and rivers of various stream orders, large and small lakes, ponds and wetlands are prevalent in the area, notably Dusey River, Gourlie Creek, Wabassi River, Buffaloskin River and their tributaries (Natural Resources Canada 2019). The Ogoki River and Albany River are Provincial Park waterways, and sections of these rivers and shorelines occur within the study area.

The general area of the Project is dominated by wetlands (e.g., bogs, fens, swamps and marshes) of the Albany River watershed and several of its sub-watersheds. The Hudson Bay Lowlands Ecozone is northernmost ecozone in Ontario and forms the core of the third largest wetland in the world (Crins *et al.* 2009), where over 68% of its land cover consist of fens, bogs or wetlands. Comparatively, approximately 22% of the land cover in the Ontario Shield Ecozone consists of treed bogs and fens and wetlands (Watkins, 2011). The wetlands within the area of the Project are not designated as provincially significant. The Ontario Wetland Evaluation System cannot be used to evaluate the extensive wetlands in the Lowlands portion within the area of the Project (MNR 2014). Wetlands in the area of

the Project will be described using other acceptable methods (e.g., Riley 2011 and Far North Science Advisory Panel 2010).

The field program will involve both aerial and ground-based survey approaches to characterize existing conditions at water body crossings within the study area. An aerial reconnaissance will be undertaken along the full extent of the study area to verify the location of mapped and unmapped water body crossings, and to further augment the existing environment information available through desktop analysis. At water body crossing locations (at approximately the centre-line of each corridor crossing), the water body type and coarse-level description of surface water and peatland features will be documented. Surface water conditions will also integrate applicable information obtained through the Indigenous Knowledge Program, where possible.

The ground-based field survey will be used to obtain site-specific field data at a subset of water body crossings to verify or augment the results and assumptions from the desktop analysis. The site selection process will be based primarily on a 'scaled approach', with a plan to select a representative number of water body crossings under three different categories of watershed size and to get representation across the alternatives.

Surface water field surveys will be completed along an approximate 200 m section of the selected water body (centred over the proposed crossing location). At each selected crossing, observed water body conditions will be documented to broadly define typical channel patterns and flow conditions, including bed and bank morphology, channel geometry and stability, channel substrate, streamflow, and riparian and / or shoreline vegetation. In addition, basic topographic channel surveys targeted at the proposed crossing may include collection of a few bed elevation shots at locations upstream and downstream of the crossing. The results of the basic topographic channel surveys will be used to generate coarse hydraulic calculations at the planned crossing structures. Basic water quality parameters (conductivity, pH, temperature, and dissolved oxygen) will be measured at all selected sites using a multi-parameter water quality meter (during the fish and fish habitat field program described in **Section 7.1.4.9**).

During the geotechnical field program, the depth of peat will be investigated since a significant portion of the Project traverses organic terrain and will have a surficial layer of peat moss. During the vegetation field survey, discussed in **Section 7.1.4.7**, peatlands will be also examined, including peat humification and degree of surface or groundwater flow for distinction of fens and bogs.

Field crews will also document any opportunistic observations on substrate type, overburden, bedrock, and / or signs of upwelling that can be used to advance the desktop analyses for the groundwater and geology components. These observations will be supplemented by field surveys outlined in **Section 7.1.4.4**.

The need for and scope of additional surveys will be determined in consultation with applicable agencies. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible.

#### 7.1.4.6 Groundwater

The exposed bedrock of the Canadian Shield, which extends across much of Central and Northern Ontario, typically is moderately to highly fractured within the upper 10 m to 20 m (Sykes *et al.* 2009), resulting in the bedrock commonly being considered an aquifer unit. Within the area of the Project, the pattern of fractures in the bedrock aquifer allows for the movement of groundwater, however, this secondary permeability generally decreases with depth (Sykes *et al.* 2009).

Within Marten Falls, sand and gravel fluvial deposits associated with the Albany River locally exceed 40 m in thickness (MECP Water Well Record #16003369) and are targeted for both domestic and public water supplies

within the community. Groundwater resources within the upper bedrock, identified as limestone on local well records, also are targeted by public well supplies within the community.

Topographic lows, such as river valleys, will have local effects on the rate and direction of groundwater movement. Groundwater flow paths frequently bend into river valleys and isolated topographic depressions, such as the Albany River and Ogoki River, as well as numerous other higher order watercourses, water bodies (e.g., lakes, ponds), and deeper bedrock hollows and valleys within topographic lowlands. Given its remote location, groundwater use within the area of the Project is expected to be minimal.

Incidental observations during the surface water field program, that may supplement the desktop analysis of groundwater quantity or quality (e.g., signs of upwelling) will be recorded opportunistically (**Section 7.1.4.5**). The need for and scope of additional surveys will be determined in consultation with applicable agencies. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible. Additionally, groundwater elevation will be recorded during the geotechnical drilling program (**Section 7.1.4.4**).

#### 7.1.4.7 Vegetation

The Project spans Ecoregion 2W (Big Trout Lake Ecoregion) within the Ontario Shield Ecozone and Ecoregion 2E (James Bay Ecoregion) within the Hudson Bay Lowlands Ecozone. The EA will include a description of vegetation at the EcoDistrict scale, as well as a map identifying the Project in relation to the Ecozone and Ecoregions it traverses.

The Ontario Shield Ecozone largely consists of conifer-dominated boreal forests (Crins *et al.* 2009). Ecoregion 2W is characterized largely by forest (63.6%), followed by treed bogs and fens (14.5%) open water (13%), other wetlands (7.5%) and the remaining 1.3% is classified as other (Watkins 2011). More specifically, within Ecoregion 2W, there is an abundance of black spruce (on both upland and lowland sites. Black spruce is often associated with Jack Pine (*Pinus banksiana*) and White Birch (*Betula papyrifera*) in upland sites. Mixed stands of Black Spruce, Balsam Fir (*Abies balsamea*) and Balsam Poplar (*Populus balsamifera*) are typically present along the shores of lakes and rivers. In lowland areas, fens and bogs with mosses, shrubs and graminoids are predominant (Crins *et al.* 2009). It should also be noted that fire is an important force of natural change within Ecoregion 2W as large amount of forests in the ecoregion are considered recent burns (Watkins 2011).

The Hudson Bay Lowlands Ecozone is northernmost within Ontario and forms the core of the third largest wetland in the world (Crins *et al.* 2009). Ecoregion 2E is characterized largely by treed bogs and fens (43.3%), followed by forest (25.5%), other wetlands (25.3%), open water (5.6%) and the remaining 0.4% is classified as other (Watkins 2011). More specifically, Ecoregion 2E is comprised of stands of stunted black spruce and tamarack (*Larix laricina*) along with scattered fens and bogs. On well-drained soils and along the edges of streams and rivers, developed stands of coniferous and mixed wood forests are present (Crins *et al.* 2009). Given the abundance of wet organic substrates and a cool humid climate, forest fire has a less significant role in Ecoregion 2E compared to Ecoregion 2W (Crins *et al.* 2009).

Ontario's Ecological Land Classification is an integrated approach to describing the biological and physical parts of a landscape, classifying areas of similar climate, topology, soil and plant communities. Ecological Land Classification information in the Far North is far behind that available for southern portions of Ontario. To support the EA, desktop research will be supplemented by aerial and ground-based survey to characterize habitat and Ecological Land Classification. Preliminary locations for vegetation surveys will be selected based on a review of aerial imagery and PLC2000 landcover types. The plant community of each survey location will be classified to the ecosite level using the Ecosites of Ontario (Banton *et al.* 2009) protocols. A description of soil, plant species, relative abundance of plant species, and presence of invasive and Species at Risk (SAR) will be recorded for each survey plot. Plant surveys are conducted during the summer months. Results of the field investigations, combined with other data sources (e.g., MNR 2019), including applicable information obtained through the Indigenous

Knowledge Program where possible, will be used to describe and map the range of vegetation communities present in the study area. During the vegetation field survey, peatlands will be also examined, descriptions of plant species, relative abundance of plant species, degree of surface or groundwater flow for distinction of fens and bogs and presence of invasive and SAR will be recorded. Peatland studies are multidisciplinary and will primarily be discussed in **Section 7.1.4.5** (Surface Water) for simplicity.

Detailed maps of the ecosites identified will be prepared and the variability of plant communities within and among ecosites will be described. Plant species lists (including vascular plants, lichens and bryophytes, where observed) will be provided. SAR will be identified and suitable habitat for these species will be extrapolated to include the entire study area.

#### Species at Risk: Vegetation

A review of the Natural Heritage Information Centre *Make-a-Map: Natural Heritage Areas* (MNRF 2019) database resulted in the record of one rare plant, the Northern marsh violet (*Viola epipsila*), as occurring within the study area. No other terrestrial vegetation SAR have been identified for the Project.

A description of soil, plant species, relative abundance of plant species, and presence of invasive and SAR will be recorded during field investigations within each vegetation survey plot; no specific field program targeting at-risk vegetation species is planned. The need for and scope of additional surveys will be determined in consultation with MECP and MNRF. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible.

#### Species of Importance to Indigenous Communities: Vegetation

A preliminary list of plant species of importance for dietary needs, medicinal needs and / or cultural and spiritual needs has been identified based on available Indigenous Knowledge. Tree species of importance include Black Spruce, White spruce (*Picea glauca*), Balsam Fir, Tamarack (*Larix laricina*), Balsam Poplar, Jack Pine, Trembling Aspen (*Populus tremuloides*) and White (dwarf) Birch (*Betula papyrifera*) were all listed as important species to the communities. The species of herbaceous plants of importance include Cottongrass, (*Eriophorum angustifolium*), Black Crowberry (*Empetrum nigrum*), blueberries (*Vaccinium spp.*), raspberries (*Rubus spp.*), Northern Labrador Tea (*Ledum palustre*), bearberry (*Arctostaphylos spp.*), gooseberry (*Ribes spp.*), dogwoods (*Cornus spp.*), small cranberry (*Vaccinium oxycoccos*), Sweetgrass (*Anthoxanthum nitens*), waterlilies (*Nymphaea sp.*), mosses (*Bryophyta*), sphagnum moss (*Sphagnum spp.*) and Caribou Lichen (*Cladonia rangiferina*), and Wild Rice (*Zizania Palustris*).

#### 7.1.4.8 Wildlife

The general area of the Project provides suitable habitat for a variety of small and large mammals, as well as various birds, amphibians, reptiles and insects that are found in the boreal forest. As described in **Section 7.1.4.7**, the area is characterized by open and treed wetlands dominated by species such as Black Spruce, sphagnum, mosses and shrubs (MFFN 2017). Upland terrestrial vegetation communities are comprised of mixed forests with species such as Jack Pine, White Spruce and poplar species (MFFN 2017). The range of habitats within the study area support the requirements for a wide range of wildlife species, such as Black Bear (*Ursus americanus*), ungulates including Moose (*Alces alces*) and Caribou (Boreal population), Gray Wolf (*Canis lupus*), Wolverine (*Gulo gulo*), lynx, American Marten (*Martes americana*), Fisher (*Martes pennanti*), Muskrat (*Ondatra zibethicus*), Striped Skunk (*Mephitis mephitis*), groundhog, Snowshoe Hare (*Lepus americanus*), River Otter (*Lontra canadensis*) and fox. It is understood through MFFN's community-based land use planning underway that Polar Bear (*Ursus maritimus*) and seals are not found in the area of the Project but are found to the east near the James Bay coast. In addition, hundreds of migratory birds inhabit the Far North region. Herptile species known to occur in the area include American Toad (*Anaxyrus americanus*), Eastern Garter Snake (*Thamnophis sirtalis sirtalis*), Wood

Frog (*Lithobates sylvaticus*), Red-sided Garter Snake (*Thamnophis sirtalis*) and Northern Leopard Frog (*Lithobates pipiens*). The latter two species are considered regionally significant (MFFN 2017). There is a strong seasonal presence of insects in the area of the Project, with mosquitos and black flies very prevalent during the spring and summer months. Dragonflies, butterflies, bumble bees, and deer and horse flies are also very common.

A field survey of wildlife and wildlife habitat is being conducted to supplement the existing information. The field surveys include:

- **Breeding Bird Point Surveys** at a variety of habitat types across the study area;
- **Marsh Bird Call Back Surveys** in suitable marsh habitats using protocols modified from Bird Studies Canada (2003) for marsh bird monitoring; and
- **Remote Wildlife Cameras** deployed within areas where wildlife concentration is predicted to occur (e.g., trails, cut lines, river banks). The cameras will be equipped to capture up to 10,000 images and will be deployed for approximately three months during the summer season. Images will be processed, and wildlife identified to species.

The need for and scope of additional surveys will be determined in consultation with MECP and MNRF. Information on wildlife and wildlife habitat within the study area will integrate applicable information obtained through the Indigenous Knowledge Program, where possible.

#### Species at Risk: Wildlife

A preliminary review of background resources was completed to obtain information on species listed as threatened, endangered or special concern (SAR) under the provincial *Endangered Species Act, 2007* or the federal *Species at Risk Act, 2002*. A comprehensive list of SAR that could potentially occur within the study area was developed and includes a total of 20 SAR with records or geographic distributions that overlap. An assessment was also completed to determine if suitable habitat for these 20 species is likely to be present within the study area. This assessment was based on a review of aerial photography and local knowledge of the area. **Table 7-4** summarizes potential wildlife SAR within the study area based on the presence of suitable habitat.

Caribou (Boreal population: *Rangifer tarandus*) occur extensively in peatland areas, such as black spruce bogs and treed fens, while generally avoiding upland areas throughout the year (Stuart-Smith et al. 1997). However, their habitat can vary in different landscapes depending on habitat availability (Ferguson and Elkie 2004). Telemetry data shows that in the Missisa and James Bay ranges (which comprise part of the study area) Caribou (Boreal population) were found to occur most frequently in peatlands, followed by coniferous forest, and they avoided deciduous forest (Ferguson and Elkie 2004). Habitat of the Nipigon range also falls within the study area. The location of winter ranges may be quite variable between years (Ferguson and Elkie 2004). Determining the population size or density of a wide-ranging low-density animal such as Caribou (Boreal population) is often challenging and likely to be inaccurate. Since 2009, several research studies led by independent contractors and the MNRF have investigated Caribou (Boreal population) and their habitat in areas crossed by the Project. The MNRF attached radio collars to a large number of Caribou (Boreal population) across northern Ontario. Satellite tracking between 2009 and 2014 identified that some of these collared individuals were found within the study area (April Mitchell, MNRF, pers. comm. 2019). Study results illustrated that individuals were nomadic and may occupy different areas from one year to another but show stronger fidelity to calving areas. Herd population estimates will be evaluated as part of the provincial EA.



Table 7-4: Potential Wildlife Species At Risk and Species At Risk Habitat

Taxa	Common Name	Scientific Name	Conservation Ranking	ESA Status	SARA Status	Source Used to Identify Occurrence in Project Area	Habitat Requirements <sup>1,2,3</sup>	Habitat Exists within Study Area
Bird	Bald Eagle	<i>Haliaeetus leucocephalus</i>	S2N,S4B	SC	-	MECP 2019, OBBA, eBird	Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. While fish are their main source of food, Bald Eagles can easily catch prey up to the size of ducks, and frequently feed on dead animals, including White-tailed Deer. They usually nest in large trees such as pine and poplar. During the winter, Bald Eagles sometimes congregate near open water such as the St. Lawrence River, or in places with a high deer population where carcasses might be found.	Candidate habitat present
Bird	Bank Swallow	<i>Riparia riparia</i>	S4B	THR	THR	MECP 2019	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.  The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stockpiles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods.	Candidate habitat present
Bird	Barn Swallow	<i>Hirundo rustica</i>	S4B	THR	THR	MECP 2019	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.  Before European colonization, Barn Swallows nested mostly in caves, holes, crevices and ledges in cliff faces. Following European settlement, they shifted largely to nesting in and on artificial structures, including barns and other outbuildings, garages, houses, bridges and road culverts. Barn Swallows prefer various types of open habitats for foraging, including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared rights-of-way, cottage areas and farmyards, islands, wetlands and subarctic tundra.	Candidate habitat present
Bird	Black Tern	<i>Chlidonias niger</i>	S3B	SC	-	MECP 2019, OBBA, eBird	Black Terns build floating nests in loose colonies in shallow marshes, especially in cattails. Vegetated marshes must be located immediately adjacent to enough open water to provide suitable nesting habitat.	Candidate habitat present
Bird	Canada Warbler	<i>Cardellina canadensis</i>	S4B	SC	THR	MECP 2019, eBird	The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks.  It is also found in riparian shrub forests on slopes and in ravines and in old-growth forests with canopy openings and a high density of shrubs, as well as in stands regenerating after natural disturbances, such as forest fires, or anthropogenic disturbances, such as logging. Canada Warbler habitat is believed to be in decline, especially in South America, where the Canada Warbler overwinters. Habitat loss has also been observed in the eastern part of its breeding range, where wet forests have been drained for urban development or farming.	Candidate habitat present
Bird	Chimney Swift	<i>Chaetura pelagica</i>	S4B,S4N	THR	THR	MECP 2019	Before European settlement, Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. However, due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. It is likely that a small portion of the population continues to use hollow trees. They also tend to stay close to water as this is where the flying insects, they eat congregate.  The Chimney Swift spends the major part of the day in flight feeding on insects. In the northern part of the breeding range, the Chimney Swift favours sites where the ambient temperature is relatively stable.	Candidate habitat present
Bird	Common Nighthawk	<i>Chordeiles minor</i>	S4B	SC	THR	MECP 2019, OBBA, eBird	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites.  The Common Nighthawk nests in a wide range of open, vegetation-free habitats, including dunes, beaches, recently harvested forests, rocky outcrops, grasslands, pastures, marshes and river banks. This species also inhabits mixed and coniferous forests. The Common Nighthawk probably benefited from the newly-opened habitats created by the massive deforestation associated with the arrival of European settlers in eastern Canada and United States. The appearance of gravel roofs contributed to the expansion of the Common Nighthawk's habitat in North America.	Candidate habitat present
Bird	Eastern Whip-poor-will	<i>Antrostomus vociferous</i>	S4B	THR	THR	MECP 2019	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands, or openings in more mature deciduous, coniferous and mixed forests. It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators.  Whip-poor-will breeding habitat is not dependent upon species composition, but rather on forest structure, although common tree associations in both summer and winter are pine and oak. The species shuns both wide-open spaces and dense forest. It prefers to nest in semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances. Other necessary breeding habitat elements are thought to involve ground-level vegetation and woodland size. Individuals will often feed in nearby shrubby pastures or wetlands with perches. Areas with decreased light levels where forest canopies are closed are generally not occupied, perhaps because of reduced forage success for this aerial-feeding insectivore.	Candidate habitat present

Table 7-4: Potential Wildlife Species At Risk and Species At Risk Habitat

Taxa	Common Name	Scientific Name	Conservation Ranking	ESA Status	SARA Status	Source Used to Identify Occurrence in Project Area	Habitat Requirements <sup>1,2,3</sup>	Habitat Exists within Study Area
Bird	Eastern Wood Pewee	<i>Contopus virens</i>	S4B	SC	SC	eBird	The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation. During migration, a variety of habitats are used, including forest edges and early successional clearings.	Candidate habitat present
Bird	Evening Grosbeak	<i>Coccothraustes vespertinus</i>	S4B	SC	SC	eBird	During the breeding season, the Evening Grosbeak is generally found in open, mature mixed-wood forests dominated by fir species, White Spruce and / or Trembling Aspen. Its abundance is strongly linked to the cycle of its primary prey, the Spruce Budworm. Outside the breeding season, the species depends mostly on seed crops from tree species in the boreal forest, such as firs and spruces. It is also attracted to ornamental trees that have seeds or fruit, and may visit bird feeders.	Candidate habitat present
Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>	S4B	SC	THR	MECP 2019, OBBA, eBird	The Olive-sided Flycatcher is most often found along natural forest edges and openings. It will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches. Olive-sided Flycatchers' breeding habitat usually consists of coniferous or mixed forest adjacent to rivers or wetlands. In Ontario, Olive-sided Flycatchers commonly nest in conifers such as White and Black Spruce, Jack Pine and Balsam Fir. The Olive-sided Flycatcher is most often associated with open areas containing tall live trees or snags for perching. These vantage points are required for foraging. This species generally forages from a high, prominent perch from which it sallies forth to intercept flying insects and then returns to the same perch. Open areas may be forest clearings, forest edges located near natural openings (such as rivers or swamps) or human-made openings (such as logged areas), burned forest, or openings within old-growth forest stands; these forests are characterized by mature trees and large numbers of dead trees. There is evidence that the breeding success of birds nesting in harvested habitats is lower than the breeding success of birds nesting in natural openings. In the boreal forest, suitable habitat is more likely to be in or near wetland areas. Although the amount of old-growth forest obviously decreased during the 20th century, the amount of habitat attractive to Olive-sided Flycatchers may have remained more or less constant, since logging operations continue to create openings favoured by these birds. However, recent studies indicate that these sites are less suitable for breeding.	Candidate habitat present
Bird	Peregrine Falcon	<i>Falco peregrinus</i>	S3B	SC	SC	MECP 2019	Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on. The Peregrine Falcon is found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. It usually nests alone on cliff ledges or crevices, preferably 50 m to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas. The natural nesting habitat has not changed significantly since the population crash and is still largely available. In addition, structures built by humans in both rural and urban areas provide the Peregrine Falcon with other potential nesting sites. And though urbanization and other land uses have had a significant effect on some areas where they feed, Peregrine Falcons can usually modify their diet based on the prey species present in a given area.	Candidate habitat present
Bird	Rusty Blackbird	<i>Euphagus carolinus</i>	S4B	NAR	SC	OBBA, eBird	During the winter, it is found in wet woodlands, swamps and pond edges, and often forages in agricultural lands. The breeding range of the Rusty Blackbird in Canada is almost entirely within the boreal forest. Breeding habitat there is characterized by coniferous-dominated forests adjacent to wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps and beaver ponds. On migration, the Rusty Blackbird is primarily associated with wooded wetlands. In winter, it occurs primarily in lowland forested wetlands, cultivated fields and pecan groves. Suitable habitat for the species appears to be decreasing on its breeding range and wintering grounds, due mainly to the loss and degradation of wetlands by human activities.	Candidate habitat present
Bird	Short-eared Owl	<i>Asio flammeus</i>	S2N,S4B	SC	SC	MECP 2019, eBird	The Short-eared Owl makes use of a wide variety of open habitats, including arctic tundra, grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. It also occasionally breeds in agricultural fields. Preferred nesting sites are dense grasslands, as well as tundra with areas of small willows. While the Short-eared Owl has a marked preference for open spaces, the main factor influencing the choice of its local habitat is believed to be the abundance of food, in both summer and winter. It nests on the ground and hunts for small mammals, especially voles. Suitable breeding, migration and wintering habitat has declined significantly throughout the 20th century, resulting in a reduction in the number of owls. In North America, it breeds sporadically in arctic areas, coastal marshes and interior grasslands, where voles and other small rodents proliferate.	Candidate habitat present
Bird	Yellow Rail	<i>Coturnicops noveboracensis</i>	S4B	SC	SC	MECP 2019, eBird	Yellow Rails are secretive birds and live deep in the reeds, sedges and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests. Nesting Yellow Rails are typically found in marshes dominated by sedges, true grasses, and rushes, where there is little or no standing water (generally 0 cm to 12 cm water depth), and where the substrate remains saturated throughout the summer. They can be found in damp fields and meadows, on the floodplains of rivers and streams, in the herbaceous vegetation of bogs, and at the upper levels (drier margins) of estuarine and salt marshes. A greater diversity of habitat types is used during migration and winter than during the breeding season.	Candidate habitat present

**Table 7-4: Potential Wildlife Species At Risk and Species At Risk Habitat**

Taxa	Common Name	Scientific Name	Conservation Ranking	ESA Status	SARA Status	Source Used to Identify Occurrence in Project Area	Habitat Requirements <sup>1,2,3</sup>	Habitat Exists within Study Area
Mammal	Caribou (Boreal population)	<i>Rangifer tarandus caribou</i>	S4	THR	THR	MECP 2019, NHIC	Caribou habitat in the boreal forest is constantly changing. Much of the forest is naturally in an unsuitable condition for Caribou at any one time, but Caribou need and use the entire landscape over time as habitat changes. Disturbances from fires, blowdown and insects can quickly change the amount and distribution of habitat. There is also great ecological variation in Caribou habitat across the province ranging from upland fire-dependent forests in the northwest, to extensive lowland forests in the northeast where fire is much less frequent. At the broad landscape scale, Caribou require large, undisturbed areas of old or mature conifer upland forest and lowlands dominated by Jack Pine and / or Black Spruce. These areas allow Caribou to effectively separate themselves from higher densities of Moose, White-tailed Deer, Grey Wolves and Black Bears which tend to be associated with younger mixed or deciduous forest. At smaller scales, Caribou seasonally select specific habitat features and areas that support successful reproduction and calf rearing, provide summer and / or winter forage, and / or facilitate movement between discrete areas of use.  In winter, Woodland Caribou use mature and old-growth coniferous forests that contain large quantities of terrestrial and arboreal (tree-inhabiting) lichens. These forests are generally associated with marshes, bogs, lakes and rivers. In summer, the caribou occasionally feed in young stands, after fire or logging. Many subpopulations of the Woodland Caribou Boreal population show a preference for peatlands; they generally avoid clear cuts, shrub-rich habitat and aspen-poplar dominated sites. The most common tree species in preferred habitats are Black Spruce, White Spruce and Tamarack.	Candidate habitat present
Mammal	Little Brown Myotis	<i>Myotis lucifugus</i>	S4	END	END	MECP 2019, BCI Range Mapping	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as 6 mm across) and this is how they access many roosting areas. Little Brown Bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing.  Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, along waterways and forest edges. Large open fields or clear-cuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.  Associated Ecological Land Classification communities include : Coniferous Forest, Mixed Forest, Deciduous Forest, Coniferous Swamp, Mixed Swamp and Deciduous Swamp where suitable roosting (e.g., cavity trees and trees with loose bark) habitat is available.	Candidate habitat present
Mammal	Northern Myotis	<i>Myotis septentrionalis</i>	S3	END	END	MECP 2019, BCI Range Mapping	Northern Long-eared Bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April.  The Northern Long-eared Bat overwinters in cold and humid hibernacula (caves / mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs along waterways, forest edges and in gaps in the forest. Large open fields or clear-cuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.  Associated Ecological Land Classification communities include : Coniferous Forest, Mixed Forest, Deciduous Forest, Coniferous Swamp, Mixed Swamp and Deciduous Swamp where suitable roosting (e.g., cavity trees and trees with loose bark) habitat is available.	Candidate habitat present
Mammal	Wolverine	<i>Gulo gulo</i>	S2S3	THR	SC	Local Knowledge	Wolverines usually live alone and roam across large territories that vary from 500 km <sup>2</sup> to 1,500 km <sup>2</sup> or more. Females build dens under snow-covered boulders, fallen logs, and occasionally in snow drifts. Researchers are still learning about the ecology and habitat needs of the Wolverine in Ontario.  A wide variety of forested and tundra habitats is used by wolverines in wilderness areas. Habitats must have an adequate year-round supply of food that consists of smaller prey species, such as rodents and Snowshoe Hares, used more in summer, and the carcasses of larger animals, like Moose and Caribou, which are an important part of the winter diet. Females den at higher elevations under rocks, logs or snow. The snow cover must persist late into the spring to insulate the den and food must be close at hand. Forestry, hydroelectric developments, oil and gas and mineral exploration and development, and transportation corridors continue to alter, remove or fragment habitats. About 6% of all current Wolverine range is within parks and protected areas.	Candidate habitat present

**Glossary**

END ESA - Endangered: a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act*.  
SARA - Endangered: a wildlife species that is facing imminent extirpation or extinction.

THR ESA – Threatened: a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.  
SARA – Threatened: a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

SC ESA - Special Concern (formerly Vulnerable): a species with characteristics that make it sensitive to human activities or natural events.  
SARA - Special Concern: a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

**References:**

1. MECP 2019
2. COSEWIC 2020.
3. McCarty 1996.



Field surveys for at-risk wildlife species will focus on:

- **Bat Maternity Roost Monitoring:**  
 A review of aerial imagery and PLC2000 landcover types conducted to identify potentially habitat for SAR bats. Bat acoustic monitors deployed within the study area in suitable habitats to record the bat activity during the maternity roosting period to determine if SAR bats are present in potential maternity roost communities.
- **Bird Surveys:**  
 Targeted surveys for bird SAR, such as Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*) and Eastern Whip-poor-will (*Antrostomus vociferus*) will be completed. Suitable habitat is identified through a review of aerial imagery and aerial reconnaissance by helicopter. Detailed inspection of suitable habitat for Bank Swallow and Barn Swallow are conducted. Acoustic monitoring devices installed within suitable habitat for Eastern whip-poor-will.
- **Remote Camera Surveys:**  
 Remote cameras deployed in a variety of habitat types where wildlife concentration may occur (e.g., wildlife trails, roads, cut lines, river banks, and other linear features). Camera data analyzed to determine number of individuals of each species at certain locations within the study area.

The need for and scope of additional SAR wildlife surveys<sup>13</sup>, including Caribou (Boreal population), is being determined in consultation with MECP and MNRF. The results of field investigations for this Project will be documented in the EA. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible.

#### Species of Importance to Indigenous Communities: Wildlife

A preliminary list of wildlife species of importance for dietary needs, and / or cultural and spiritual needs has been identified based on available Indigenous Knowledge. Wildlife species on this preliminary list includes Gray Wolf, American Marten, American Mink (*Neovison vison*), Moose, Black Bear, Beaver (*Castor canadensis*), Muskrat, River Otter, Boreal Woodland Caribou (*Rangifer tarandus caribou*), White-tailed Deer (*Odocoileus virginianus*), Arctic Fox (*Vulpes lagopus*), Fisher and Wolverine, and Bald Eagle (*Haliaeetus leucocephalus*).

#### 7.1.4.9 Fish and Fish Habitat

The general area of the Project includes a multitude of aquatic features throughout the landscape dominated by wetlands (e.g., bogs, fens, swamps and marshes) of the Albany River watershed and sub-watersheds.

Numerous streams and rivers, large and small lakes, ponds and wetlands that provide habitat for a variety of fish and wildlife are prevalent in the area of the Project, notably the Albany River, Ogoki River, Dusey River, Gourlie Creek, Wabassi River, Buffaloskin River and their tributaries (Natural Resources Canada 2019). Fish use of these waterbodies will vary as a result of factors such as availability of suitable habitat (spawning, overwintering, rearing, and feeding) and connectivity to other waterbodies.

Over 20 species of fish, primarily of cool and cold-water thermal regimes, are known to inhabit these waters and are regulated by the *Fisheries Act*. Species including Northern Pike (*Esox Lucius*), Walleye (*Sander vitreus*), Lake Whitefish (*Coregonus clupeaformis*), Brook Trout (*Salvelinus fontinalis*), Yellow Perch (*Perca flavescens*), Cisco (*Coregonud artedi*) and Burbot (*Lota lota*) are target species of the communities inhabiting the region and by local and fly-in charter angling and hunting tourist outfitters. Lake Sturgeon (*Acipenser fulvescens*), also important for Indigenous communities throughout the area, are present in the area of the Project. In addition to the species listed

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13. Initial surveys for SAR were completed in 2018.

above, the following fish species, which are common and widespread throughout Ontario, have the potential to occur in the area of the Project where suitable habitat is present (Eakins 2018):

- Northern Redbelly Dace (*Chrosomus eos*);
- Finescale Dace (*Chrosomus neogaeus*);
- Lake Chub (*Couesiius plumbeus*);
- Common Shiner (*Luxilus cornutus*);
- Northern Pearl Dace (*Margariscus nachtriebi*);
- Emerald Shiner (*Notropis atherinoides*);
- Blacknose Shiner (*Notropis heterodon*);
- Spottail Shiner (*Notropis hudsonius*);
- Mimic Shiner (*Notropis volucellus*);
- Bluntnose Minnow (*Pimephales notatus*);
- Fathead Minnow (*Pimephales promelas*);
- Longnose Sucker (*Catostomus catostomus*);
- White Sucker (*Catostomus commersonii*);
- Silver Redhorse (*Moxostoma anisurum*);
- Shorthead Redhorse (*Moxostoma macrolepidotum*);
- Trout-perch (*Percopsis omiscomaycus*);
- Brook Stickleback (*Culaea inconstans*);
- Ninespine Stickleback (*Pungitius pungitius*);
- Mottled Sculpin (*Cottus bairdii*);
- Slimy Sculpin (*Cottus cognatus*);
- Iowa Darter (*Etheostoma exile*);
- Johnny Darter (*Etheostoma nigrum*); and
- Logperch (*Percina caprodes*).

The study area is large and contains a number of water features which require assessment. As a result of the broad scale, the field program will involve both an aerial and ground-based survey approach to characterize existing conditions at water body crossings within the study area. The aerial and ground-based field surveys will be done in coordination with the collection of surface water information (**Section 7.1.4.5**). Indigenous Knowledge related to fish and fish habitat collected through the Indigenous Knowledge Program will also be integrated, where possible.

The fish habitat assessment will involve the classification of instream habitat by distinct habitat units (i.e., areas of similar habitat type) and be modeled after the Ontario Stream Assessment Protocol (Stanfield 2007). Information describing the fish and aquatic communities (either based on fishing effort, habitat suitability for known or suspected SAR, or desktop information) and physical habitat parameters (including channel widths and depths, channel velocity, substrate, and instream cover). *In situ* physico-chemical parameters (e.g., pH and temperature) will be recorded at each station. Fish presence and relative abundance will be evaluated in the vicinity of the water body crossing locations using backpack electrofisher and / or baited minnow traps sampling methods.

The ground-based field surveys will be used to obtain site-specific field data at a subset of water body crossings (approximately 10% of the total number of mapped and unmapped waterbody crossings) to verify or augment the results and assumptions from the desktop analysis. The site selection process will be based primarily on a 'scaled approach', with a plan to select a representative number of water body crossings under three different categories of watershed size and to get representation across the alternatives.

#### Species at Risk: Fish

The Project falls within the range of the Southern Hudson Bay-James Bay population of Lake Sturgeon (*Acipenser fulvescens*), and Lake Sturgeon is known to occur in the Albany River and its tributaries, as well as Ogoki River Provincial Park waterways (COSEWIC 2017). The Southern Hudson Bay-James Bay populations are designated as Special Concern under the provincial *Endangered Species Act* and hold no status under Schedule 1 of the federal *Species at Risk Act*. Therefore, despite differing designations and protection requirements of other populations in Ontario, the South Hudson Bay-James Bay populations of Lake Sturgeon are not afforded protection under these Acts.

**Table 7-5** includes information on the distribution of at-risk fish species and their habitats based on readily available information; no field surveys are planned to target at-risk fish species. The need for and scope of additional surveys will be determined in consultation with MECP and MNRF. Applicable information obtained through the Indigenous Knowledge Program will also be integrated, where possible.

**Table 7-5: Potential Fish Species At Risk and Species At Risk Habitat**

Taxa	Common Name	Scientific Name	Conservation Ranking	ESA Status	SARA Status	Source Used to Identify Occurrence in Project Area	Habitat Requirements <sup>1,2,3</sup>	Habitat Exists within Study Area
Fish	Lake Sturgeon	<i>Acipenser fulvescens</i>	S3?	SC	SC	Committee on the Status of Endangered Wildlife in Canada 2017, DFO Aquatic Species at Risk Maps	<p>The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of 5 m to 20 m. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents.</p> <p>The species occupies a wide variety of aquatic ecosystem types (e.g., stepped-gradient Boreal Shield rivers, low-gradient meandering Prairie rivers, low gradient Hudson lowland rivers, Great Lakes and associated tributaries). Lake Sturgeon requires a variety of habitats to complete its lifecycle, and the species has evolved to exploit typical upstream to downstream hydraulic and substrate gradients. Hatch is contingent on aeration by flowing water, after which larvae apparently require gravel substrate in which to bury and remain while development continues. Once the yolk sac is absorbed, larvae drift downstream via water currents. Habitat requirements at the age-0 stage are not well understood, but may not be as strict as previously assumed. Aside from the requirement of adequate benthic prey items, the habitat requirements for middle to later life stages (juveniles and adults) are not particularly narrow. Habitat trends vary across the species' range. In some areas, the construction of dams has ceased but, in other areas, it is expected to continue into the foreseeable future. Sediment and water quality has improved in many areas formerly affected by pollution from the pulp-and-paper industry.</p> <p>Large lakes / rivers &gt; 20 m deep with soft mud, sand or gravel bottoms required.</p>	Candidate habitat present

**Glossary** SC ESA - Special Concern (formerly Vulnerable): a species with characteristics that make it sensitive to human activities or natural events.  
 SARA - Special Concern: a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

**References:** 1. MECP 2019\  
 2. COSEWIC 2020.  
 3. McCarty 1996.



### Species of Importance to Indigenous Communities: Fish

A preliminary list of fish species of importance for dietary needs, and / or cultural and spiritual needs has been identified based on available Indigenous Knowledge. Fish species include Walleye, Northern Pike, Lake Whitefish, Brook Trout, Chain Pickerel (*Esox niger*), Yellow Perch, Cisco, Burbot, Longnose Sucker, White Sucker, Lake Sturgeon and Lake Chub.

#### 7.1.4.10 Social, Economic and Built Environment

The social, economic and built environment assessment will consider five subcomponents including socio-community (social), economy, land and resource use, human health and community safety, and visual aesthetics. Primary data collection programs will support all components of the social, economic and built environment assessment.

#### Social

The closest populated areas to the Project are the Indigenous communities of MFFN and Aroland First Nation. The Marten Falls Ogoki Post settlement is located in the study area and is inhabited by members of MFFN. MFFN has a population of 814 registered members with approximately 352 of registered members residing on the Marten Fall Reserve. The remaining 462 registered members live elsewhere in municipalities such as Thunder Bay and urban centres in Greenstone (e.g., Geraldton or Nakina, located approximately 230 km and 160 km, respectively, south-southwest of the Marten Falls Ogoki Post settlement). The population is steadily increasing, which is anticipated to continue in the future (MFFN 2014). Languages within the MFFN community include English and dialects of Ojibwe and Oji-Cree (also known as Severn Ojibwe). The designated service centre for the MFFN community is Greenstone (MFFN 2014).

MFFN is also a member of the Matawa First Nations Management Inc., a regional tribal council consisting of nine Ojibway and Cree First Nations communities in the Nishnawbe Aski Territory of Northern Ontario. Nishnawbe Aski Nation, the Political Territorial Organization provides political, social and economic support for all First Nation communities in the Treaty #9 geographic area (MFFN 2014).

Matawa First Nations Management Inc., which includes Aroland First Nation, Constance Lake First Nation, Eabametoong First Nation, Ginoogaming First Nation, Long Lake #58 First Nation, MFFN, Neskantaga First Nation, Nibinamik First Nation and Webequie First Nation, provides advisory and / or program services to member First Nations when requested.

MFFN is governed by a Chief and up to seven councillors with elections held once every two years (MFFN 2014). Under the *Indian Act*, MFFN has the power to establish by-laws governing health, traffic and other areas. Federal statutes apply on reserve land while provincial statutes may apply if there is no existing by-law (MFFN 2014). Aboriginal Affairs and Northern Development Canada funds programs and services administered by MFFN.

Marten Falls has approximately 65 houses (Statistics Canada 2017a). Most housing is classified as band housing with approximately two-thirds of housing defined as suitable (Statistics Canada 2017a). Housing is predominantly in two subdivisions. One is older along the west shoreline of the Albany River. The second is a newer subdivision built parallel to the older subdivision (MFFN 2014).

Marten Falls has an airport 5 km from the community, which is maintained by the MTO. The only scheduled all-season access to the MFFN community is a three times per week air service from an airport operated by Zam Air Service from Nakina, Ontario and, by a three times per week air service from Thunder Bay by North Star Air. Both airlines offer passenger and freight services. Seasonal access is also provided by the winter road (MFFN 2014). Electricity is provided to Marten Falls through Ontario Hydro Remote Services (MFFN 2014). Heating primarily

occurs through wood burning for homes and oil furnaces for commercial properties. Despite having a water treatment plant, water and sewer infrastructure, a boil advisory is currently in place as the water treatment plant undergoes service (MFFN 2017). The MFFN community has a landfill 3.5 km north of the community where residents can deposit their waste (MFFN 2014). Bell Canada provides telephone service while K-Net provides limited broadband internet services. Administration offices are computerized with internet, fax and telephone access, according to the CBLUP team. Television is available through satellite. News to the MFFN community is provided by Wawatay bi-weekly and the Chronicle Journal daily (MFFN 2014). In October 2019 the Province of Ontario announced funding towards the Matawa broadband project in which five Matawa communities, including the community of MFFN will have access to high-speed fibre-optic internet, no announcements on project timelines have been made (Government of Ontario 2019e).

To the south of the Project is Aroland First Nation. The Indigenous community has approximately 110 houses with 86% classified as suitable (Statistics Canada 2017b). Aroland First Nation is a road accessible community connected to Highway 643. The road is available in all seasons. Community infrastructure in the Aroland First Nation community includes electricity (Ontario Hydro), water, sewage and solid waste disposal (MNR disposal site). Communication services include phone and television service provided by Bell, the Chronicle Journal newspaper, and radio provided by the Canadian Broadcasting Corporation. Transportation services in the community include a bus and taxi service. Bus service is provided by the First Nation (Matawa First Nations Management Inc., n.d.).

### Economy

Economic development in the area of the Project is undertaken predominantly by MFFN in partnerships with adjacent First Nations and industry. When requested, Matawa Economic Development Advisory Services will assist member First Nations to promote and foster sustainable economic development through the delivery of quality information products, capacity-building initiatives and collaborative working projects (Matawa First Nations Management Inc. 2019). The closest Indigenous communities to the Project are MFFN and Aroland First Nation. These communities are likely to have the most economic interest in the Project. The Municipality of Greenstone is also likely to have economic interest in the Project due to its position as the primary service centre for these communities and its population of MFFN community members.

The primary economic activities in the region include mining, forestry and resource-based tourism. Mining exploration and development is expanding. The Agoke Development Corporation includes MFFN, Eabametoong First Nation and Aroland First Nation, and was formed to manage the Ogoki Forest Management Unit. The Agoke Development Corporation Limited has a partnership with Nakina Lumber Incorporated – the Agoke Lumber Limited Partnership. This Partnership and other Matawa communities have pursued the forestry industry, although the forestry industry in this region has been economically limited due to the downturn in the industry (MFFN 2014). A prohibitive factor to large development projects such as mining and forestry is transportation costs and infrastructure access. The lack of electricity and a reliable transportation network increase costs undermining the feasibility of enterprises.

Economic opportunity is limited within MFFN. The unemployment rate is high at 18.8% with a low labour participation rate of 50% (Statistics Canada 2017a). Median income is also low at \$14,944, which is well below the provincial average (Statistics Canada 2017a). Within the MFFN community there are a number of small private businesses including a convenience store, a grocery store, a fuel supply business and a lodging business. Resource based tourism operations are also operated by community members. Information obtained through the community based land use planning process indicates that, depending on fur markets, trapping can provide economic opportunity and contribute to the sale of crafts, such as hats, moccasins and snowshoes. Some MFFN community members also engage in the tradition of tanning hide and the sale of paintings, carvings, beading and baskets. The cost of living in the community is high due to the lack of access resulting in high costs for electricity and goods due to the transportation costs of fuel and goods.

Currently, small businesses operate within Aroland First Nation including a gas bar, convenience store, taxi company and tourist outfitters (Matawa First Nations Management Inc. n.d.). Aroland First Nation has similar labour market conditions to MFFN with low labour participation and high unemployment (Statistics Canada 2017b). Similar to MFFN, economic opportunity is limited in Aroland First Nation. However, Aroland First Nation is currently connected to the provincial highway network, which could provide economic opportunity to the community. The median income of \$13,920 is low relative to the provincial average (Statistics Canada 2017b). Aroland First Nation's primary employment sectors include primary industries, retail, administration, education, health care, recreation, accommodation and food services (Statistics Canada 2017b).

Greenstone has a more diversified economy than MFFN with a greater variety of people employed in different sectors (Municipality of Greenstone 2015). Greenstone has an unemployment rate of 10.6% with a labour force participation rate of 57.4%. The unemployment is 3.2% higher than the provincial average while the labour force participation is 7.3% lower than the provincial average (Statistics Canada 2017c). Forestry, tourism and mining are key components of the Greenstone economy with Long Lake Logging and Premier Gold as major private sector employers (Municipality of Greenstone 2015).

### Land and Resource Use

The area of the Project has a remote wilderness character, with most land used for resource harvesting and tourism. Major economic activities near the Project include forestry and mining exploration. Existing land use may include those designated by Indigenous community, and municipal, provincial and federal government.

A majority of the Project is expected to occur on lands regulated under the *Far North Act, 2010*. The *Far North Act* is the legislative foundation of land use planning in the Far North of Ontario (Government of Ontario 2014b). Far North land use planning is a joint planning process with the Ontario Government and Indigenous communities to identify where development can occur and where land is dedicated to protection in the Far North, which covers 42% of Ontario's land mass (Government of Ontario 2012). The purpose of the Act is to provide for CBLUP in the Far North of Ontario. The Project is expected to occur entirely in the area that will be covered by the MFFN CBLUP, which is under development but that has not yet been finalized.

A small portion of the Project to the south is located on Crown land designated as General Use Area. The Crown land under this designation is subject to Crown Land Use Policy Report G2697: Geraldton Area. This policy provides direction for the management of lands within General Use Area designation, permits, road development and maintenance (MNR 2005).

The Albany River Provincial Park is located to the west of MFFN, along the Albany River and subject to Crown Land Use Policy Report P2657: Albany River Provincial Park (MNR 2006). The Ogoki River Provincial Park is located to the southwest of MFFN. The Little Current River Provincial Park is located to the south of the existing winter access road. The Park is along the Little Current River and Percy Lake, which the winter access road was moved from as the Park was developed (MFFN 2017). Provincial parks are regulated under the *Provincial Parks and Conservation Reserve Act, 2006*, which provides the framework for the creation, removal and alteration of provincial parks (Government of Ontario 2014a). The Albany River Provincial Park is a waterway class park with important fish harvesting and wilderness canoeing operations. MFFN, Eabametoong First Nation and Mishkeegogamang First Nation have traditional interest in this Park for transportation, recreation and harvesting (Golder Associates Ltd. 2018a). While these communities may have traditional interests in the Park, their interest may not overlap with the Project due to the area the Park covers extending far west of the Project. The Ontario Parks Planning Management Policies (1992 Update) aims to protect the natural, cultural and recreational values for which provincial parks are regulated (Golder Associates Ltd. 2018a).

Industries such as mining, aggregate production and forestry are important to the overall land use in northern Ontario. The region has a high degree of mining interests related to the Ring of Fire chromite deposits as well as

other mineral claims. Both alternatives overlap a high number of mineral claims belonging to multiple mining companies. Currently, no all-season ground access exists to these claims or claims of interest north of the MFFN community. Aggregate resources are available near both alternatives, and towards the southern portion of the study area. Aggregate resource development is required for road projects as it is required for construction. Two Forest Management Units may overlap the Project: Ogoki Forest and Kenogami Forest. Forest Management Units are a geographic planning area setting boundaries for wood harvesting under a Sustainable Forest Licence (Government of Ontario 2013b).

Currently, a winter road is constructed annually to provide access to the MFFN community and to bring in goods such as heavy equipment, supplies and construction materials. The road is typically operational about six to eight weeks annually between the months of February to March if conditions are favourable.

Resource harvesting is a common practice for Indigenous and non-Indigenous Peoples in the region. Common resource harvesting practices in northern Ontario include fishing, gathering, hunting and trapping. Ontario regulates these activities under the *Fish and Wildlife Conservation Act, 1997*. The Act outlines restrictions on hunting and fishing, presents licensing and safety requirements and defines permitted methods. However, this provincial legislation does not affect Indigenous rights regarding these activities considering the existing Aboriginal and Treaty Rights of the Indigenous Peoples of Canada are recognized and affirmed in section 35 of the *Constitution Act, 1982*. Access for these activities is available through boat launches and float planes access. Recreational fishing and hunting are popular activities in northern Ontario, drawing in tourists and local harvesters. Common target species for locals and tourists include moose, deer, black bear, pike, walleye and trout (Golder Associates Ltd. 2018b).

Additional non-consumptive tourism also occurs in the region including hiking, canoeing and snowmobiling. These activities rely on waterways and trails. Formal Ontario Federation of Snowmobile Club snowmobile trails are not within the area of the Project but snowmobiling still likely takes place within the region (Ontario Federation of Snowmobile Clubs 2019). The Project likely transects a variety of trails and waterways used for recreation and tourism in the region. The Albany River Provincial Park is also identified as used for recreation activities in the region (Golder Associates Ltd. 2018a).

The Project occurs within the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) Tourism Region 13C where \$109 million was spent by tourists from Ontario, other places in Canada, and overseas in 2016 on pleasure tourism. Tourism in the region is generally resource-based, with outfitting as a key tourism activity, with 841,000 visits including participation in an outdoor / sports activity (e.g., 368,600 visits included fishing, 343,600 visits included boating) as the main purpose of their trip. Most of these tourists come from Ontario. Outfitting involves hunting, fishing or canoeing in remote locations with or without a guide. These tourist activities rely on their remote setting and wilderness setting to attract clients. The Albany River is an important tourism feature in the region with canoeing, hunting and fishing opportunities available through guided outfitting services (KBM Resources Group 2014, Golder Associates Ltd. 2018a). Approximately 10 tourism operators have been identified as potentially having overlapping operating areas within the study area. Mapping identifying the location of tourism operators, and recreation and commercial activities will be included in the EA where practicable.

### Human Health and Community Safety

Marten Falls is policed by the Nishnawbe-Aski Police Service. Tactical and emergency response are managed jointly with the Ontario Provincial Police. Provincial court services are operated within the MFFN community regularly. Legal representation is provided by Nishnawbe-Aski Nation legal services. The MNRF provides forest fire protection services starting 16 km outside of MFFN. No fire trucks are present within the community.

Health Canada funds the Muskeg Thunder Clinic, located in Ogoki Post, which operates five days per week. Health staff provide nursing services, health promotion and community health programs. Emergency medical services are

provided in Greenstone with medivac aircraft used for transportation. Specialized medical services are provided in Thunder Bay at the Thunder Bay Regional Health Centre. Community health programs focus on mental health, addiction, prenatal and maternal health. Matawa First Nations Management Inc., Nishnawbe-Aski Nation and the Ontario government provide family support, prevention and intervention programs within the MFFN community. Child welfare and family services programs are provided based out of Aroland First Nation with one person being employed by the MFFN community, but not based in the community.

Within Aroland First Nation, health services include the Aroland Health Centre and Tikanangan Child and Family Services Centre. Emergency services in the community include the Aroland First Nation Fire Department. Emergency medical services are provided by the Township of Nakina and, if unavailable, the Township of Geraldton. Aroland First Nation has a Crisis Team Coordinator who provides support to communities, families and individuals, referral services, family violence prevention and access to ongoing healing programs.

The diet in the region relies on traditional subsistence harvesting with limited access to modern foods (Gamble 2017). The high cost of living and transportation likely contributes to this as goods are expensive and in short supply relative to communities with road access.

### Visual Aesthetics

The remote wilderness aesthetic is an important component of the visual environment in the area of the Project as related to the tourism industry, and residents of the local communities. Visual aesthetics of the Project region are largely influenced by natural processes such as wildfires, and limited human influences such as the existing local communities and winter roads.

### Data Collection Methods

The following describes data collection activities. Data will be obtained from a variety of existing sources as further detailed in **Appendix A** including, but will not be limited to:

- Statistics Canada Community profiles;
- First Nation government information;
- Spatial Data;
- Municipal reports and plans;
- Provincial reports and plans;
- Federal reports and plans;
- Non-Governmental Organization and academic reports;
- Community based land use planning; and
- Regional industry sector reports.

A review of available desktop information will be completed to identify information gaps and inform data collection for the Project. This will allow for more focused questioning targeted at specific data gaps and relevant items for each Indigenous community. Desktop information will also be reviewed following the data collection for the Project to reaffirm and expand upon any new insights gained.

The purpose of data collection for the Project is to confirm and update data obtained from existing information sources, and to obtain additional information on the socio-economic and land use activities undertaken within the potentially affected communities and area of the Project. Interviews with relevant key contacts will be a key form of primary data collection. In some cases, it may be desirable to undertake focus-groups sessions. Interviews are expected to be undertaken with representatives of Indigenous communities, municipal governments and land users. Where possible, in-person interviews will be conducted, otherwise representatives will be interviewed by phone. Interviews will be guided by a survey instrument (e.g., interview guide, survey, questionnaire) to increase

consistency with the input that is requested. Within Indigenous communities, the MFFN will attempt to interview members of Chief and Council, women, elders and youth.

Interviews (either in-person or by phone) will be undertaken with tourism operators, recreation club leaders, industry groups and / or other land users where interested persons are willing. A request to complete a written questionnaire may be requested if an interview is not possible with the identified representative.

To support the interviews, relevant background information will be provided including mapping and an option to keep all information shared during the interview confidential. An opportunity for the interview subject to ask questions regarding the Project will also be provided.

Information from the Indigenous Knowledge Program will be integrated to inform components of the social, economic and built environment whenever relevant. The characterization of the social environment will not reference sensitive material, which is not fitting for the public forum, such as the location of important cultural sites.

#### *7.1.4.11 Archaeology and Cultural Heritage*

Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes. Known (previously recognized) and potential cultural heritage resources will be identified and described within the EA.

##### *Archaeological Sites and Resources*

The Project is located in the Ontario Shield and Hudson Bay Lowlands Ecozones, covering Ecoregions 2W and 2E, which are comprised of upland boreal forest and lowland forest and extensive lowlands, respectively. The tertiary watershed systems in the area include the Albany-Makokibatan, Lower Ogoki, Little Current and Upper Albany-Muswabik, which would have provided important historical travel routes. Distance to modern or ancient water sources is one of the most important determinants of past human settlement patterns, along with drainage, glacial geomorphology and the general topographic variability of the area.

While no other archaeological assessments are known to have been completed within the study area, some archaeological assessment has been undertaken in the broader region. Previous Stage 1 archaeological assessments have been completed in and near the western edge of the Project for pits and quarries proposed by the mining industry. Previous archaeological surveys along the Albany River (Julig 1982) have demonstrated the rich archaeological record of the region, including several thousand years of Anishnaabe occupation. The area has been noted to have been occupied for thousands of years, including 20<sup>th</sup> century mining exploration in the region. There are four registered archaeological sites within 50 km of the Project, including the Marten (Martin) Falls House (Ejlp-1), which is found on the southern bank of the Albany River, approximately 12 km east of the westernmost proposed route, two sites of unknown cultural affiliation and site type (Baxter site (Eilr-1) and Twin Point site (Eilr-2)), and one pre-contact Indigenous camp (Feldbruegge site [Eglk-1]).

The Albany River was one of the first interior waterways west of James Bay to be explored by Europeans, beginning with the French between 1657 and 1751. During this time, they established interior posts which included the Marten Falls House, Henley House, and Gloucester House which are in proximity to the study area. At present, these fur trade posts are considered archaeological sites with minimal, if any, above ground heritage considerations.

A Stage 1 archaeological assessment to identify areas of archaeological potential within the study area will be undertaken by a licensed archaeologist. The Stage 1 archaeological assessment will be submitted for the MHSTCI review during the EA. A Stage 1 archaeological assessment to identify areas of archaeological potential within the study area will be undertaken. The assessment will document the archaeological, land use history and existing

conditions within the study area through a review of recent and historical maps, previous archaeological assessments in proximity to the study area, the MHSTCI Archaeological Sites Database for a listing of registered archaeological sites and will also consider Indigenous Knowledge and related Indigenous land use information from both the pre- and post-contact periods to determine areas of archaeological potential. This information will be used to inform the need for any additional studies.

Should results of the Stage 1 archaeological assessment confirm archaeological potential within the directly affected area of the preferred alternative, further stages of archaeological assessment will be completed as early as possible prior to the completion of detailed design. Areas that cannot be visually determined to be permanently wet, and are not sloped, will be subject to Stage 2 test pit survey using the alternative strategies for special survey conditions in northern Ontario and on Canadian Shield terrain, as per Section 2.1.5 of the Standards and Guidelines for Consultant Archaeologists (MTCS 2011). Site selection will be completed through consideration of a number of factors, including but not limited to:

- desktop mapping exercises, including detailed stream ordering and removal of physical landscape features of low archaeological potential (e.g., bog, wetlands);
- proximity to historic water sources or other areas identified as having archeological potential (based on the results of the Stage 1 archaeological assessment);
- professional judgement by a licensed archaeologist;
- incorporation of available Indigenous Knowledge;
- consultation with MHSTCI; and
- aerial reconnaissance via helicopter.

Archaeological assessment(s) will be conducted by a licensed archaeologist and will meet the requirements of the *Ontario Heritage Act* and the Standards and Guidelines for Consultant Archaeologists (MTCS 2011). The results of the Stage 2 archeological assessment will inform the need for further archaeological investigation where effects to identified archaeological resources cannot be avoided through detailed design.

### Built Heritage Resources and Cultural Heritage Landscapes

In addition to archaeological resources, which focus on specific localities and material remains of past occupation, there are also Cultural Landscapes that are of strong cultural heritage value. A Cultural Landscape is geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including Indigenous communities. The landscape may include features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association (Government of Ontario 2014c). The Cultural Landscapes within the study area will be identified and characterized following the process set out in the MHSTCI document *Heritage Resources in the Land-use Planning Process; Info Sheet #2, Cultural Heritage Landscapes* (MTCS 2005). Since the Landscapes to be addressed are largely Associative (i.e., they do not consist of formal built structures or “neighbourhoods”), the key information sources will be Indigenous Knowledge and discussions with knowledgeable community members.

## 7.2 Potential Environmental Effects

A preliminary identification of potential environmental effects associated with the undertaking during the construction and operations phases is provided in **Table 7-6**. As part of the EA, the potential positive and negative, direct and indirect environmental effects will be evaluated using applicable effects assessment criteria developed during the EA that will be based on standards, guidelines, objectives or other accepted ecological thresholds, informed by consultation with Indigenous communities, government agencies and interested persons, as well as information obtained through the Indigenous Knowledge Program (**Section 3.4.2.1**). A direct effect occurs when there is a change due to a project activity, whereas an indirect effect occurs when a change to a criterion resulting from a project activity causes a change to another criterion (e.g., changes in noise levels could affect wildlife).

**Table 7-6: Preliminary Identification of Potential Environmental Effects**

Environmental Component	Discipline	Potential Effect
<b>Indigenous Peoples' Rights and Interests</b>	<i>Aboriginal and Treaty Rights and Interests</i>	<ul style="list-style-type: none"> <li>■ Changes in or loss of sites and areas used for traditional activities (hunting, trapping, fishing, gathering)</li> <li>■ Changes in the availability and quality of lands and resources used for traditional activities</li> <li>■ Changes in access to lands and resources used for traditional activities</li> <li>■ Changes in or loss of culturally important sites and areas (e.g., ceremonial sites, sacred areas, Place Names, oral history sites, teaching sites)</li> <li>■ Changes in the sufficiency of lands and resources for cultural traditions</li> <li>■ Changes in the experience of being on the land</li> <li>■ Changes to cultural traditions</li> </ul>
<b>Natural (Physical and Biophysical)</b>	<i>Atmospheric Environment</i>	<ul style="list-style-type: none"> <li>■ Changes to air quality</li> <li>■ Change in GHGs</li> </ul>
	<i>Acoustic Environment</i>	<ul style="list-style-type: none"> <li>■ Changes in noise levels</li> <li>■ Changes to vibration</li> </ul>
	<i>Physiography, Geology, Terrain and Soils</i>	<ul style="list-style-type: none"> <li>■ Changes to topography and ground stability</li> <li>■ Changes to soil quality</li> <li>■ Changes to soil quantity</li> </ul>
	<i>Surface Water</i>	<ul style="list-style-type: none"> <li>■ Changes to surface water quality</li> <li>■ Changes to surface water quantity and flow</li> </ul>
	<i>Groundwater</i>	<ul style="list-style-type: none"> <li>■ Changes to groundwater quality</li> <li>■ Changes to groundwater quantity and flow</li> </ul>
	<i>Vegetation</i>	<ul style="list-style-type: none"> <li>■ Loss and alteration of vegetation communities</li> <li>■ Changes to species diversity</li> </ul>
	<i>Wildlife</i>	<ul style="list-style-type: none"> <li>■ Loss and alteration of wildlife habitat (availability, use, connectivity)</li> <li>■ Change in wildlife population (abundance and displacement)</li> </ul>
	<i>Fish and Fish Habitat</i>	<ul style="list-style-type: none"> <li>■ Loss and alternation of fish habitat (riparian, instream)</li> <li>■ Change in fish population (injury and mortality)</li> </ul>
<b>Social, Economic and Built Environment</b>	<i>Social</i>	<ul style="list-style-type: none"> <li>■ Change in population and demographics</li> <li>■ Change in availability and use of public services and infrastructure</li> <li>■ Changes to housing</li> <li>■ Changes to community well-being</li> </ul>
	<i>Economy</i>	<ul style="list-style-type: none"> <li>■ Change in employment and income</li> <li>■ Change to the regional economy</li> <li>■ Change to government finances</li> <li>■ Change to industrial opportunities</li> </ul>
	<i>Land and Resource Use</i>	<ul style="list-style-type: none"> <li>■ Changes to provincial parks and protected area lands</li> <li>■ Changes to existing industrial uses</li> <li>■ Changes to recreational and commercial lands used for trapping, hunting, fishing and other activities</li> </ul>
	<i>Human Health and Community Safety</i>	<ul style="list-style-type: none"> <li>■ Changes in air quality, noise levels and water quality</li> <li>■ Changes to public health and community safety</li> <li>■ Changes to diet</li> <li>■ Changes to access to health and emergency facilities and care</li> </ul>
	<i>Visual Aesthetics</i>	<ul style="list-style-type: none"> <li>■ Alteration of existing landscape and visual character of the area (e.g., scenic values and viewpoints)</li> </ul>
<b>Archaeology and Cultural Heritage</b>	<i>Archaeological Resources</i>	<ul style="list-style-type: none"> <li>■ Damage to, or the loss of, archaeological sites and / or resources</li> <li>■ Disturbance or destruction of archaeological resources</li> </ul>
	<i>Built Heritage Resources and Cultural Heritage Landscapes</i>	<ul style="list-style-type: none"> <li>■ Disturbance or destruction of built heritage resources and / or cultural heritage landscapes</li> <li>■ Disturbance or destruction of registered and unregistered cemeteries</li> <li>■ Disruption of cultural heritage resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character and setting of cultural heritage resources</li> </ul>

As part of the assessment, consideration will be given to confirming whether net effects of the undertaking could combine with effects of other past, present, and reasonably foreseeable projects (cumulative effects). Cumulative effects are the incremental changes that may occur from the combined influences of multiple activities (Hegmann *et al.*, 1999). Although the effect of each individual activity may not be significant, the additive effects of all activities together may lead to a different outcome. The Code of Practice (MECP 2020) encourages proponents to provide information about potential cumulative effects in the EA since cumulative effects are part of the MECP's Statement of Environmental Values, which are principles the ministry considers when making environmentally significant decisions. The study area for the cumulative effects assessment and identification of projects (e.g., mining, other linear infrastructure) that may act cumulatively with the Project will be determined in the EA.

On March 2, 2020, the Government of Ontario, MFFN and Webequie First Nation announced their agreement to advance planning and development of a proposed Northern Road Link. This is a new proponent and is separate from the Proponent of the CAR Project, where only MFFN is the Proponent. The proposed Northern Road Link would provide reliable, all-season road access to potential mine sites in the Ring of Fire region. A road to the Ring of Fire would be subject to approvals separate and independent from this Project. The Northern Road Link project will be considered for inclusion in the cumulative effects assessment of the Project.

The Minister of Environment and Climate Change determined that a regional assessment of the Ring of Fire region will be conducted pursuant to the *Impact Assessment Act* (IAA) (IAAC 2020b). This is an assessment independent of the EA for the CAR, however, should information relevant to the cumulative effects assessment for the Project arise from the regional assessment of the Ring of Fire within an appropriate timeline it will be used.

The potential environmental effects identified in **Table 7-6** are based on the environmental features that may be affected by the proposed undertaking. A high-level description of the potential effects is provided in the following sections. The potential effects identified within this ToR are preliminary and will be further developed during the EA. The EA will also recommend impact management measures to avoid or minimize potential environmental effects, as well as identify opportunities to enhance benefits to the environment.

The potential effect of the environment (i.e., climate change) on the undertaking will be addressed through a climate change risk assessment of the preferred alternative, based on the principles of the Engineers' Canada Public Infrastructure Engineering Vulnerability Committee protocol and International Standards Organization 31000 and Ontario's Guide for Considering Climate Change in the Environmental Assessment Process (MOECC 2017). Current conditions and future conditions will feed into a climate change risk assessment of the preferred alternative. Indigenous Knowledge compiled through the Indigenous Knowledge Program will be used to guide and inform the climate change risk assessment.

## 7.2.1 Indigenous Peoples' Rights and Interests

The Project may raise concerns of interested persons for potential effects to the natural environment including wildlife, vegetation and water resources. Potential effects to the environment may affect Indigenous Peoples through subsequent effects on Indigenous use of lands and resources for traditional purposes. The Project also has the potential to affect Indigenous cultural sites and traditions.

The potential effects to Indigenous Peoples and the exercise of Aboriginal and Treaty Rights include, but are not limited to the following:

- Change to the amount of available reserve lands for MFFN;
- Compatibility of the Project with CBLUP undertaken by Indigenous communities with traditional territory in the area of the Project;

- Changes in the availability and / or quality of resources, including potential changes associated with increased access by non-Indigenous land users as a result of the Project, that may influence Indigenous land and resource use activities (e.g., hunting, harvesting, gathering) within the area of the Project;
- Changes in access to lands and resources used for traditional activities (hunting, trapping, fishing, gathering) and cultural sites within and beyond the area of the Project through effects on linear features such as trails and waterways, and camps / cabins;
- Changes to subsistence hunting, trapping, fishing and gathering as protected under Aboriginal and Treaty Rights;
- Changes to Indigenous landscape features such as Place Names, Boundary Markers and Orientation Points through disturbances to the land within the area of the Project;
- Change to cultural sites such as ceremonial, grave, sacred, gathering and worship areas that may occur in the area of the Project;
- Changes to the experience of being on the land; and
- Changes to cultural traditions and / or the ability to pursue and transmit cultural traditions (i.e., knowledge transmission).

### **7.2.2 Atmospheric Environment**

Construction and operation of the CAR has the potential to affect local air quality. Effects to the atmospheric environment from construction would be temporary and result from emissions of combustion products such as nitrogen oxides and carbon monoxide, and suspended particulate from the operation of machinery and equipment. Emissions from construction would be highly localized to the area of work during the specific time-frames planned for each section of road development.

Following construction, the operation of the CAR would also contribute changes in the local air quality from the likely increase in vehicular traffic volume (i.e., all-season availability compared to current use of winter road only) and likely reduction in air traffic volume as a result of the all-season road access. Vehicular exhaust emissions consist primarily of nitrogen oxides, carbon monoxide, sulphur dioxides, suspended particulates, volatile organic compounds and GHG emissions. The regeneration of suspended particulates from vehicle movement along the CAR would also contribute to local air quality. In general, effects of vehicular traffic emissions tend to be localized to approximately 500 m on either side of a roadway.

The GHG emissions from the Project will be estimated, based on industry standards and other publicly available information and compared to the provincial, national and industry profile GHG emissions.

### **7.2.3 Acoustic Environment**

Project construction activities, including equipment and machinery use, geotechnical drilling and blasting, have the potential to cause temporary noise and vibration effects at sensitive receptors. These effects are not anticipated to be long-term due to the temporary nature of construction activities. However, once constructed, the CAR will provide a route for the transportation of people and supplies, and potentially industrial, forestry and mining traffic as well. Therefore, the CAR will be designed to accommodate a range of heavy and light vehicle types. These types of vehicles do not typically generate significant vibration levels, and it is expected that the CAR has a low potential for producing vibration effects. Given the rural nature of the area surrounding the Project, it is expected that ambient sound levels will be low and that traffic along the CAR has the potential to cause a perceptible change in the acoustic environment at nearby sensitive receptors. The location of receptor locations will be informed by input received through the Indigenous Knowledge and consultation programs, where applicable.

## 7.2.4 Physiography, Geology, Terrain and Soils

Potential effects of road construction include changes to topography due to cut and fill for grading, blasting of bedrock and removal of overburden needed for the CAR, construction access roads and structure foundations. Quarries, borrow areas and aggregate source areas are likely to be sourced locally, which will create pits and depressions where materials have been extracted in the area of the Project. Changes to topography as a result of the Project may cause indirect effects, such as changes to surface water drainage and sub-catchment areas.

Blasting may result in areas of slope instability. Where unstable rock structures are encountered, design modifications (e.g., minor refinements to the route) may be implemented to minimize potential effects from erosion, settlement, slope instability, foundation failure or rock fall hazards that could occur as a result of construction.

Changes in soil quality and quantity may occur during construction due to increased potential for erosion, sedimentation, mixing and compaction resulting from vegetation clearing, excavation, use of heavy equipment and stockpiling of cleared materials. Aggregate rock, with potential for Acid Rock Drainage and Metal Leaching may result in changes to surface and groundwater chemistry. Changes in soil quality may also occur due to accidental release of contaminants during construction from the use of equipment and machinery (e.g., use of chemicals, explosives and fuel, equipment washing) and from vehicles during operation of the CAR (e.g., leaks and spills from road users). Maintenance activities during operations of a roadway do not typically involve the use, storage or handling of large quantities of potential contaminants other than equipment fuels and / or lubricants. Road salt is not expected to be used during winter maintenance, however, the EA will conservatively assess the potential effects of road salt on soil quality, particularly along the road edges.

## 7.2.5 Surface Water

Construction and operation of the Project will require permanent infrastructure crossings of watercourses along the CAR and temporary crossings along construction access roads. Watercourse crossings may include bridges, culverts, fords, corduroy, swamp mats, ice and snow crossings, which may result in changes to surface water quality and quantity. Equalization culverts will also be installed at locations where it is determined that spring-melt or storm runoff needs to pass from one side of the CAR to the other.

It is anticipated that effects to surface water will be primarily related to sediment and erosion, potential introduction of contaminants from accidental releases and from materials uses during road maintenance (e.g., road salt and dust suppressants), use of quarry, borrow and aggregate materials having acid rock drainage or metal leaching potential. Changes to surface water quality and quantity may cause indirect effects to other environmental disciplines such as fish and fish habitat, and wetlands.

Activities during construction, such as vegetation clearing, grading, excavation, equipment and machinery use, and stockpiling of materials may result in sedimentation into nearby waterbodies due to the creation of exposed and unstable soils. Erosion into surface water may result in changes to concentrations of sediment, baseflows and water temperatures. These activities may also affect surface water quality through the introduction of contaminants from blasting activities and equipment used during construction, and from maintenance activities (e.g., salt, sand and dust suppressant application) and accidental releases from vehicles during the operation of the CAR.

Placement of stockpiles, soil compaction and impervious surfaces may change surface drainage patterns as well, which may result in effects to surface water quantity and quality. The placement of temporary and permanent structures in watercourses has the potential to change stream dynamics and morphology, and cause erosion and sediment issues.

The Project will consider MNRF and DFO recommended practices outlined in *Ministry of Natural Resources and Forestry / Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings* (MNRF / DFO 2016) and *Environmental Guidelines for Access Roads and Water Crossings* (MRNF 1990).

## 7.2.6 Groundwater

Construction activities such as use of quarry, borrow and aggregate materials having acid rock drainage or metal leaching potential, dewatering, water use, and the creation of impervious surfaces have the potential to result in effects to groundwater quality, quantity and flow. Where dewatering occurs, there may be a temporary lowering of the local water table. A lowering of the water table may result in changes in groundwater quantity, which could decrease baseflow to watercourses, groundwater discharge to wetlands and groundwater flow patterns. These effects are typically confined to the zone of influence from dewatering activities and are temporary in nature. In addition, any private water wells located within the dewatering zone of influence may be temporarily affected by lower well yields and / or changes in water quality. Mapping that identifies the location and parameters of registered and unregistered groundwater supply wells will be provided in the EA as applicable. Should effects to wells be predicted in the EA, impact management measures and corrective actions will be recommended.

Blasting of bedrock also has the potential to change groundwater quantity. In rare cases, vibrations from blasting in bedrock can alter the fracture geometry, open new fractures, change the aperture of existing fractures, or permanently change local groundwater flow patterns. Groundwater quality may also be affected through agitation of subsurface conditions and the potential release of fine particulate and / or soluble substances. In the event a groundwater supply well is located within the area where ground vibration results from blasting activities, groundwater supply wells may become physically damaged and result in a reduction in well yield and / or water quality.

Construction dewatering has the potential to change groundwater quality in areas of substantial groundwater recharge through the release of contaminated construction dewatering discharge. When not mitigated effectively, groundwater discharges may also result in erosion and deposition of soils along the discharge path, elevated suspended solids and potential release of contaminants to receiving waterbodies. Groundwater quality may also be affected by leaks and accidental releases of contaminants during construction and operations.

## 7.2.7 Vegetation

Potential effects on vegetation and ecological communities include changes to community diversity (including community loss), changes to wetland quantity and function and changes to species diversity, including SAR and traditional use plants.

Activities related to construction, such as vegetation clearing, stockpiling of materials, laydown areas and excavation could result in the removal and degradation of vegetation, including forested and wetland areas. Direct (i.e., permanent vegetation removal) and indirect (e.g., changes to vegetation due to changes in soil and / or surface water from erosion and sedimentation, dewatering, water-taking or water discharging activities, and accidental release of contaminants) disturbances have the potential to change the form and function of the vegetation and ecological communities. Fragmentation of vegetation and ecological communities, such as wetlands, may also occur as a result of the construction of temporary and permanent components of the Project.

Dust resulting from construction activities and vehicle use of the CAR may damage vegetation primarily through physical effects such as cell destruction and blocked stomata (Spellerberg 1998). Dust accumulation on plants may also affect photosynthesis, respiration and transpiration, which are important processes required for plant survival (Farmer 1993). Materials used during road maintenance (e.g., road salt or dust suppressants) may have an indirect effect on vegetation and wetlands along the road edge through a potential change in soil and / or surface water quality.

Spread of invasive plant species may also occur during vegetation clearing and be introduced on equipment and machinery containing seeds of invasive species.

## 7.2.8 Wildlife

Potential effects on wildlife and wildlife habitat, including SAR, during construction and operation of the CAR include habitat alteration and / or loss, change in wildlife mortality risk and change in wildlife behaviour.

The potential effects to vegetation (**Section 7.2.7**) may result in effects to wildlife where vegetation that provides suitable habitat will be lost or altered by the Project. This includes direct habitat loss, habitat degradation and fragmentation during site preparation (e.g., vegetation clearing and site grading), and stockpiling of materials, transportation of equipment and materials, and excavation activities. These activities may negatively affect wildlife habitat through increased erosion and sedimentation, soil removal, disturbance and compaction, and accidental release of contaminants. Wildlife may also be displaced during construction when habitat is removed (e.g., clearing and grubbing). Forested habitats are generally associated with a higher number of bird nests per hectare, therefore, the removal of these habitats may result in the displacement of more breeding pairs per hectare compared to other habitats such as grasslands or agricultural fields (Calvert et al. 2013). Also, the effects of dewatering, water-taking or water discharging activities, may negatively affect wildlife and wildlife habitat, particularly for species habitat dependant on surface water or groundwater (e.g., amphibian breeding habitat).

The Project construction and operation phases may result in a higher potential for accidental wildlife mortality through collisions with vehicles, equipment and machinery. Increased mortality risk is of concern during sensitive life stages (e.g., breeding season).

Noise, lights, and human presence have the potential to change wildlife behaviour through disturbance or attraction of wildlife (e.g., insects attracted to lights). Disturbance to wildlife during site preparation (e.g., vegetation clearing) and other construction activities, may result in long-term effects (e.g., a decreased breeding success for nesting birds [Environment Canada 2014]). Operation of the CAR may result in continued disturbance and increased risk of mortality of wildlife species through vehicular collisions.

The CAR will provide year-round access to the Far North, which is likely to increase access for recreational and traditional resource use. This has the potential to result in an increase in hunting pressure and predation due to increased sight-lines along linear corridors, a change to seasonal migration pathways, higher risk of the introduction of invasive species, parasites and disease, and the accidental release of contaminants to waterbodies.

## 7.2.9 Fish and Fish Habitat

The EA will assess potential effects of the Project on fish and fish habitat, which will consider fish species that have the potential to be located within the study area. Project-related effects on surface water quality and quantity (**Section 7.2.5**) may result in indirect effects on fish and fish habitat, including SAR. Deposition of sediment in a waterbody can result in the loss of or alteration to habitat, alteration to baseflows or water temperatures, disruption of fish life processes, and fish and egg mortality.

The construction of temporary (e.g., bridges, cofferdams, fords, corduroy, swamp mats, culverts, ice and snow crossings) and permanent (e.g., bridges, culverts) watercourse crossings, and blasting as required, have the potential to result in adverse effects to fish and fish habitat. The potential effects associated with placement of structures in water includes disruption of life processes such as migration and spawning due to fish passage issues, fish mortality due to equipment and machinery, dewatering, water-taking or water discharging activities, changes in water quality (e.g., accidental release of contaminants), and the degradation, alteration or loss of fish habitat and function. To mitigate potential adverse effects on fish and fish habitat, waterbody crossings and culvert installations will be designed and installed in accordance with applicable provincial and federal guidelines and standards to avoid harmful alteration, disruption or destruction of fish habitat.

Blasting near waterbodies may cause the release of blast residues, particles at high velocity, instant and significant pressure changes and exposed soils. This may result in fish and egg mortality and degradation, alteration or loss of habitat.

The CAR will provide year-round access to the Far North, which is likely to increase access to waterbodies for recreational use. This has the potential to result in an increase in angling pressure to fish populations, higher risk of the introduction of invasive aquatic species, parasites and disease, and the accidental release of contaminants to waterbodies.

### **7.2.10 Social, Economic and Built Environment**

The Project may alter the demographics, population, regional economy, labour market and public services of communities within or near the Project. These changes may result in a different socio-economic environment within communities, including differing socio-economic structures such as systems and institutions based on the construction and operation of the CAR. The extent of these changes will be based on the land users in the vicinity of the Project and Project procurement. For example, the location of the CAR relative to trapping areas may affect the livelihood of trappers using those areas or the presence of the road may alter the economic makeup of the community. Regarding land use, the Project will disturb lands affecting wildlife, vegetation and water resources. These changes may affect human activities including resource harvesting, existing land uses and industrial uses of the land. Potential effects of the Project are likely to include, but are not limited to:

- Potential changes to the community (e.g., easier access to goods) may entice members of MFFN to return to or exit the community. Changes to population may affect the availability of housing for community members. If population increases or demographics change, strain on public services and infrastructure may also occur. These changes may also change use of Indigenous languages and affect the well-being of the community, including social cohesion.
- Changes in population and access to the Far North for recreational activities (e.g., fishing and hunting) may alter the ability of Indigenous communities to access country foods.
- The Project may result in effects to human health by altering public safety (including potential increased illicit activities, conflicts and other potential harms to communities and their members), public health, diet and mental health. These changes may be facilitated by additional access to and from southern communities year-round.
- Potential changes to provincial parks and protected area lands that may affect their values.
- Potential changes to recreation and commercial land uses due to changes in access, wildlife, vegetation or water resources. These changes may affect the enjoyment of these activities, which may affect the tourism sector such as potential negative effects due to public access, and / or enabling new tourism, including cultural tourism, through improved access.
- Changes to industry and resource extraction activities such as mining, aggregate, forestry, linear infrastructure and energy projects. New access may allow industry opportunities to become more feasible thereby allowing for an increase in existing and new development.
- Changes to the regional economy including the labour market. Additional access may affect the local economy through new opportunities for businesses, a lower price of goods and new development.
- Changes to visual aesthetics of the visual landscape through the introduction of a CAR within a primarily undisturbed environment. Certain landscapes are more susceptible to change and more sensitive due to the angle, distance of viewer, as well as the cultural significance to viewers.

The CAR may also provide benefits in the form of skill development, training and job creation. Potential benefits include, but are not limited to:

- Reduced cost of living in the community;
- Opportunities for employment;
- Improved access to goods and services, such as education and training and health services; and
- Increase of band members living year-round in the community.

It is possible that barriers may exist that may prevent or affect the ability to participate in Project benefits. Potential barriers, should they exist, will be identified during the EA, and where feasible, measures to enhance benefits of the Project will be considered.

### **7.2.11 Archaeology and Cultural Heritage**

Archaeology and cultural heritage resources (archaeological resources, built heritage resources and cultural heritage landscapes) may be affected by the Project. Potential environmental effects to archaeology and cultural heritage resources include the potential to disturb or destruct resources within the area of the Project through ground disturbance activities (e.g., vegetation clearing and grading) and vibration generated by heavy equipment.

Technical cultural heritage studies (e.g., archaeological assessment[s], Cultural Heritage Report: Existing Conditions and Preliminary IA) will be undertaken during the EA process and will identify preliminary effects and recommend avoidance and / or impact management measures where potential effects on archaeology and cultural heritage resources are predicted to occur.