

PROJECT 4 - ALL-SEASON ROAD CONNECTING BERENS RIVER TO POPLAR RIVER FIRST NATION

ENVIRONMENTAL IMPACT STATEMENT

Project Summary

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(updated)

Submitted to:
Canadian Environmental Assessment Agency

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1.0 INTRODUCTION AND ENVIRONMENTAL IMPACT ASSESSMENT CONTEXT

1.1 Introduction

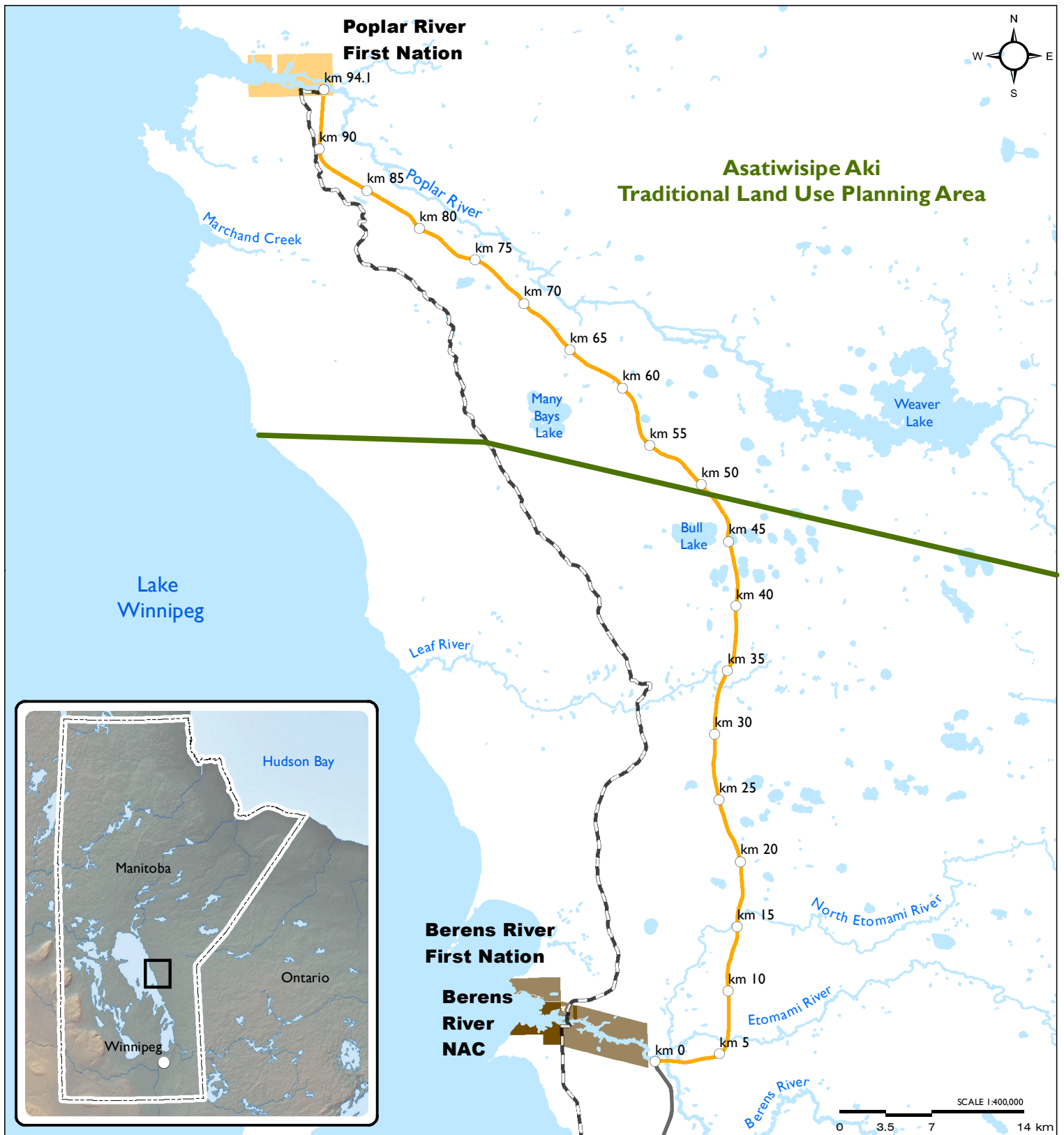
This document provides a summary of the detailed Environmental Impact Statement (EIS) for a proposed all-season road connecting Berens River First Nation and Poplar River First Nation (the 'Project') submitted to the Canadian Environmental Assessment Agency and Manitoba Conservation and Water Stewardship (MCWS) by the Manitoba East Side Road Authority (ESRA). The document provides an overview of the proposed Project components and activities, the extensive engagement activities completed to-date and potential environmental effects of the Project and proposed mitigation measures. ESRA's conclusions on predicted residual environmental effects and the significance of those effects are presented. This document has been prepared in both of Canada's official languages.

The proposed Project is the construction and maintenance of a 94.1 km two-lane gravel all-season road to be located on provincial Crown land on the east side of Lake Winnipeg between Berens River First Nation and Poplar River First Nation (**Figure 1**). The proposed road will serve as an extension to an all-season road that is currently under construction between Manitoba Provincial Road 304 and Berens River First Nation. The proposed road, referred to as Project 4 or P4, will begin immediately east of Berens River First Nation (approximately 270 km by air northeast of Winnipeg) and extend north to Poplar River First Nation (approximately 400 km by air northeast of Winnipeg). The P4 Project will provide year-round vehicular access between communities and to Manitoba's southern road network. Currently both First Nation communities must depend on restricted seasonal winter road access or other modes of travel (e.g., airplane) to access their communities and southern goods and services.

The Project is one of a series of all-season roads planned for a regional transportation network on the east side of Lake Winnipeg by ESRA (**Figure 2**), a provincial Crown Agency, and the proponent of the proposed Project between Berens River and Poplar River First Nations. A key focus of the regional transportation network and this Project is to provide opportunities for east side residents to participate in, and benefit from, the construction of the all-season road network through jobs, training and economic development opportunities. Construction of the proposed all-season road between Berens River First Nation and Poplar River First Nation is expected to generate beneficial economic effects including employment and contract opportunities for east side residents.

1.2 Environmental Setting of the Project

The proposed Project is located in an undeveloped and largely inaccessible area of the Boreal Shield Ecozone (Smith *et al.* 1998) within the Lake Winnipeg watershed that drains north and east to Hudson Bay. The area is generally characterized by flat, low-lying, and poorly-drained land with forest patches of black spruce and tamarack interspersed with bogs and fens, and bedrock outcrops.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 1
Proposed P4 All-Season Road Alignment

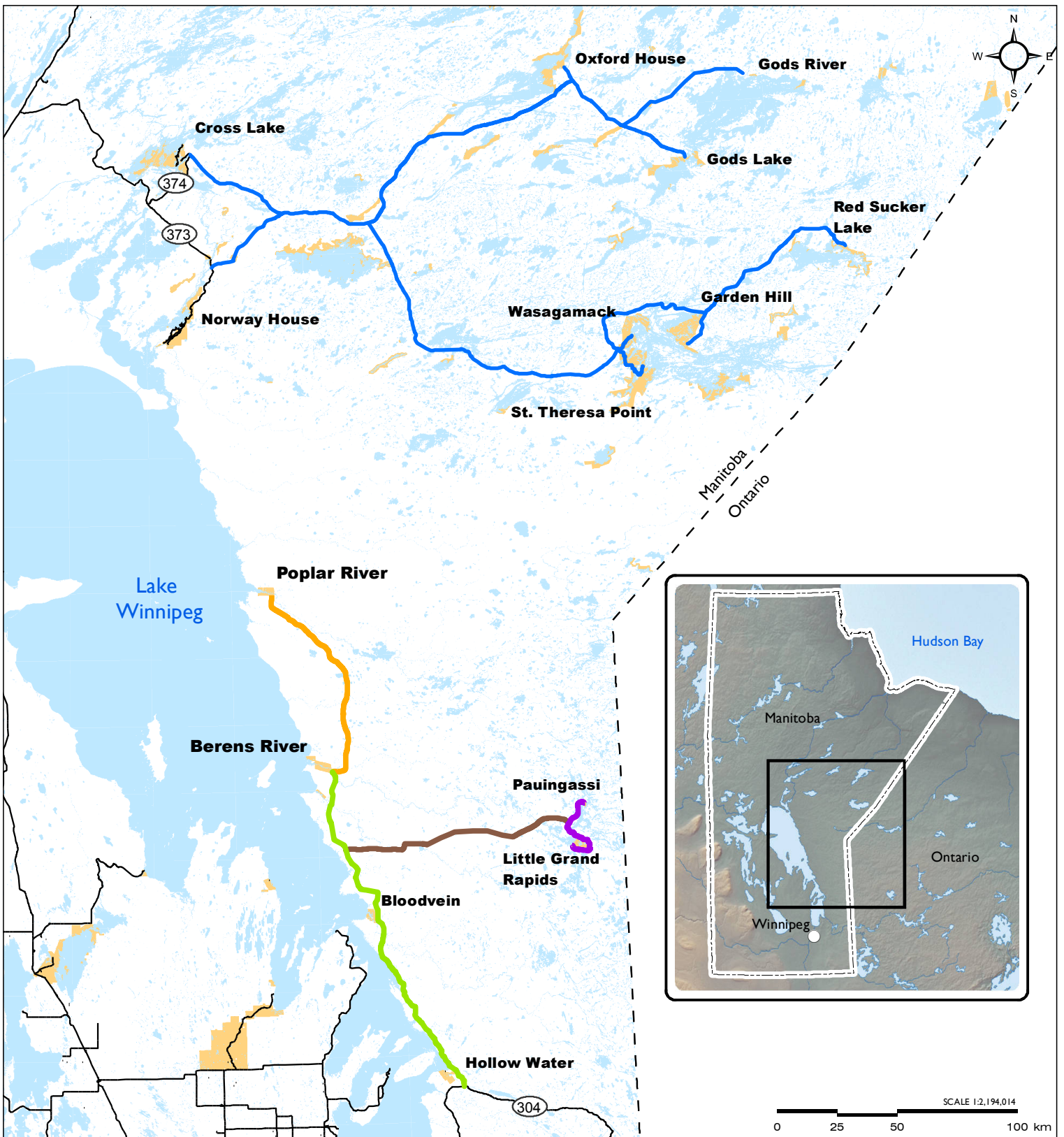
- | | |
|--|--|
| P4 All-Season Road Alignment (April 2015) | Asatiwisipe Aki Traditional Land Use Planning Area |
| 5 km Station | Berens River First Nation Reserve |
| PI All-Season Road (South of Berens to PTH 304) - Under Construction | Poplar River First Nation Reserve |
| 2013/2014 Manitoba Winter Road | Berens River Northern Affairs Community |

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/DM
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016





Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 2
Regional Transportation Network of Planned All-Season Roads on the East Side of Lake Winnipeg

- Proposed P4 All-Season Road
- Project 1 All-Season Road (Currently Under Construction)
- Proposed Project 7a All-Season Road
- Proposed Project 7 All-Season Road
- Potential East-West All-Season Road Network
- First Nation Reserve

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
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The Project will cross four fish-bearing rivers (Berens River, Etomami River, North Etomami River, and Poplar River) as well as vegetation communities and wildlife habitats. Within these areas, common and less-common aquatic and terrestrial species are known to occur including Species at Risk such as lake sturgeon and boreal woodland caribou.

The Project is not located within any nationally or provincially-designated parks or protected areas. There are no National Historic Sites, National Parks, Heritage Rivers, or other federally-protected areas in the vicinity of the Project. The closest provincially-designated protected area (Pelican Park Island Reserve) is located approximately 30 km southwest of the southern terminus in Lake Winnipeg and the closest Provincial Park (Atikaki) is located approximately 45 km to the east of the southern terminus of the Project.

Access to the area is presently restricted to local travel on foot, by boat or snow machine, or by air. During the winter season a winter road connects the communities of Berens River and Poplar River with the road network to the south. The proposed Project will replace the existing winter road between the two communities.

Land use in the vicinity of the Project consists mainly of traditional activities of community members from Poplar River and Berens River First Nations including hunting, trapping, fishing, camping, timber harvest for firewood, recreation activities, sacred/ceremonial use, and food and medicinal plant gathering. There are no known residences in immediate proximity to the Project and all land is owned by the provincial Crown. There are no existing or past commercial development sites or industrial facilities in the vicinity of the Project with the exception of commercial traplines and some former wild rice harvesting areas that are currently inactive. A transmission line extends north from Manitoba Hydro's grid along the east side of Lake Winnipeg to Berens River First Nation and on to Poplar River First Nation where it terminates.

The nearest federal lands to the proposed Project are Berens River First Nation and Poplar River First Nation located at the south and north termini of the proposed all-season road, respectively. Both First Nation communities have expressed their support for the proposed Project through Community Benefits Agreements with ESRA. Berens River Northern Affairs Community (NAC) is located adjacent to Berens River First Nation. There are no other Aboriginal or other communities located on or near the proposed alignment and there are no Treaty Lands Entitlement areas in the vicinity of the Project.

Project development is expected to generate economic benefits for Berens River First Nation and Poplar River First Nation communities including employment and contract opportunities for community members, as well as direct and indirect local business opportunities such as guiding services, recreational equipment supply, restaurants, overnight accommodations, and vehicle sales and servicing. Regional hauling companies and local and regional suppliers of construction materials and supplies, goods and services, and other provisions are also expected to benefit from the construction and operation phases of the Project. With the completion of the Project, the communities are expected to

benefit from an overall lower cost of living due to the more cost-efficient and reliable all-season road mode of transportation for people, goods and services.

1.3 Regulatory Context

The construction and operation of an all-season public highway that requires a total of 50 km or more of new right-of-way is considered a Designated Project under the *Canadian Environmental Assessment Act, 2012*. The proposed P4 Project is, therefore, considered a Designated Project which triggers the requirement for a federal environmental impact assessment (EIA) under the Act. Provincially, the proposed P4 Project is considered a ‘Class 2’ development (i.e., a two lane road at a new location with associated facilities and borrow pits) under the Classes of Development regulation of *The Environment Act* of Manitoba and requires an *Environment Act* Licence which triggers the requirement for a provincial environmental assessment.

A 433 metre (m) community access route located on Poplar River First Nation Reserve lands is proposed and will follow a separate environmental review process conducted by Indigenous and Northern Affairs Canada (INAC) under Section 67 of the *Canadian Environmental Assessment Act, 2012*.

The Canadian Environmental Assessment (CEA) Agency and MCWS are the authorities responsible for federal and provincial review of the proposed Project, respectively. Project-specific guidance has been issued by the CEA Agency ([Final Environmental Impact Statement Guidelines](#)) for the preparation of the EIS. With respect to Manitoba’s *The Environment Act*, the scope of the EIA has been developed respecting information requirements stipulated in Licensing Procedures Regulation 163/88 of the Act and as outlined in ESRA’s ‘Project 4 All-Season Road Connecting Berens River to Poplar River First Nation Environmental Assessment Scoping Document’ submitted to MCWS and the response of the Provincial Technical Advisory Committee (TAC) regarding the scoping document¹. This Project Summary and the detailed EIS are being submitted to MCWS and the CEA Agency and it is expected that these submissions will be jointly reviewed by both governments. Previously, projects that required a review under both federal and provincial environmental assessment legislation were coordinated under the provisions of the [Canada-Manitoba Agreement on Environmental Assessment Cooperation \(2007\)](#); however, this agreement has since expired.

In addition to the federal and provincial environmental assessment regulations, a variety of other federal and provincial legislation and associated regulations and standards will apply to the Project including legislation related to protection of the environment and human health and safety (e.g., the federal *Fisheries Act*, *The Workplace Safety and Health Act* of Manitoba). Provincially, work permits required under *The Crown Lands Act* for various road construction activities (e.g., quarries) on provincial Crown lands will be secured prior to construction of the proposed Project.

¹ The Scoping Document and TAC comments regarding the scoping document are provided in the MCWS Public Registry file 5747.00 accessible at: <http://gov.mb.ca/conservation/eal/registries/5747berenspoplarroad/index.html>

2.0 PROJECT OVERVIEW

The proposed Project is the construction and maintenance of a 94.1 km all-season road between Berens River First Nation/Northern Affairs Community and Poplar River First Nation. By connecting these communities, the proposed Project will provide all-season access for the community of Poplar River with the southern Manitoba road network. The proposed all-season road will be constructed on provincial Crown land and will connect to, and extend north from, ESRA's Project 1 (P1) all-season road currently under construction from Provincial Road (PR) 304 near Hollow Water First Nation to Berens River (see **Figure 1** for the local area location of the Project and **Figure 2** for the regional location of the Project). The source of funding for construction and operation of the proposed Project is the Manitoba Government.

2.1 Project Phases

The key phases of the proposed Project are:

1. Planning;
2. Design;
3. Construction; and
4. Operations and Maintenance.

2.1.1 Planning and Design Phases

The Project is currently in the planning phase with some design activities also being advanced. For the P4 Project, the planning phase began with the identification of broad road corridors, possible road alignments within the corridors, selection of the final road alignment and the recent preparation of road designs. Some permitted exploratory clearing was required to support information requirements for the selection of the road alignment. Baseline environmental studies were initiated during this phase and included gathering information that influences the development of the road design. This included studies of heritage resources, fisheries, wildlife, soil and vegetation assessments, geophysical surveys, quarry inspections, Aboriginal and public engagement, and Traditional Knowledge studies and workshops. The environmental impact assessment is conducted during this planning phase.

The design phase of the Project has recently been initiated and will continue during the provincial and federal environmental approval and licensing for the Project. During the design phase, the functional and detailed construction design will be completed and environmental protection plans finalized. Bridge and stream crossing locations, quarry and borrow areas, temporary access routes, construction staging areas and construction camps will also be detailed, surveyed, and flagged. Detailed geotechnical investigations and testing will be conducted along the proposed all-season road right-of-way, temporary access routes and at quarry sites and borrow areas.

2.1.2 Construction

During the construction phase, equipment, machinery, vehicles, construction materials and supplies including fuel, generators, trailers and other provisions, will be transported to the Project area via the newly constructed P1 all-season road from PR 304 to Berens River First Nation. Construction supplies and equipment will also be transported to staging areas at Berens River and Poplar River First Nations, and potentially to selected locations of the proposed all-season road via the existing 92.7 km-long winter road. The Project will be constructed in approximately 10 segments beginning from both Berens River First Nation and Poplar River First Nation, to maximize benefits to these communities and optimize construction scheduling and resource use. Segments will be constructed sequentially such that completion of the construction phase at one segment will initiate construction of the adjacent segment. Right-of-way clearing will be conducted in similar segments, with clearing being completed during the winter months, where feasible, to facilitate machinery access and to minimize potential adverse environmental effects.

Vegetation along the right-of-way will be cleared on the inside of curves to increase sightlines of road users. Equipment marshalling areas, laydown areas, and construction camps will be prepared within the cleared right-of-way, where feasible. Rock quarries and borrow areas will be cleared and prepared for use. Rock fill and granular materials will be excavated, crushed, sorted, and stockpiled. The Project roadway, bridges, and culvert crossings will then be constructed. Culverts will be installed as construction progresses along the alignment.

Temporary facilities and work areas including quarry and borrow areas, access routes, staging areas and construction camps that will not be needed for future maintenance activities will be demobilized and rehabilitated following construction. Gravel from temporary work areas will be removed and used in quarry and borrow area rehabilitation. The borrow areas will be excavated to the permitted depths and widths and will be levelled and trimmed when the excavation is complete.

2.1.3 Operations, Maintenance and Decommissioning

Following construction, the P4 all-season road will be owned and operated by the Government of Manitoba. Once the all-season road is designated as a departmental road (Provincial Road) under *The Highways and Transportation Act*, the Government of Manitoba will assume responsibility for road safety, operations and stewardship. The estimated 10 year average annual traffic volume for the proposed road is less than 500 vehicles.

Maintenance activities for the proposed Project, such as routine grading, topping the road with additional aggregate, management of vegetation and culvert cleanouts will occur over the life of the road. Aggregate materials will be sourced from quarries located on provincial Crown land adjacent to the Project right-of-way and will be deposited on the road surface using dump trucks, dozers and graders. Dust suppression treatments (e.g., water, chemicals) may be periodically used to control dust on the road surface as required. Only chemicals approved for use in Canada will be used, applied as specified by the manufacturer, and only if and where necessary (i.e., not beyond the road surface).

During winter, snow clearing will be conducted using graders, loaders and truck-mounted plows. Road maintenance and safety methods used will conform to the most current Manitoba Infrastructure and Transportation practices and guidelines.

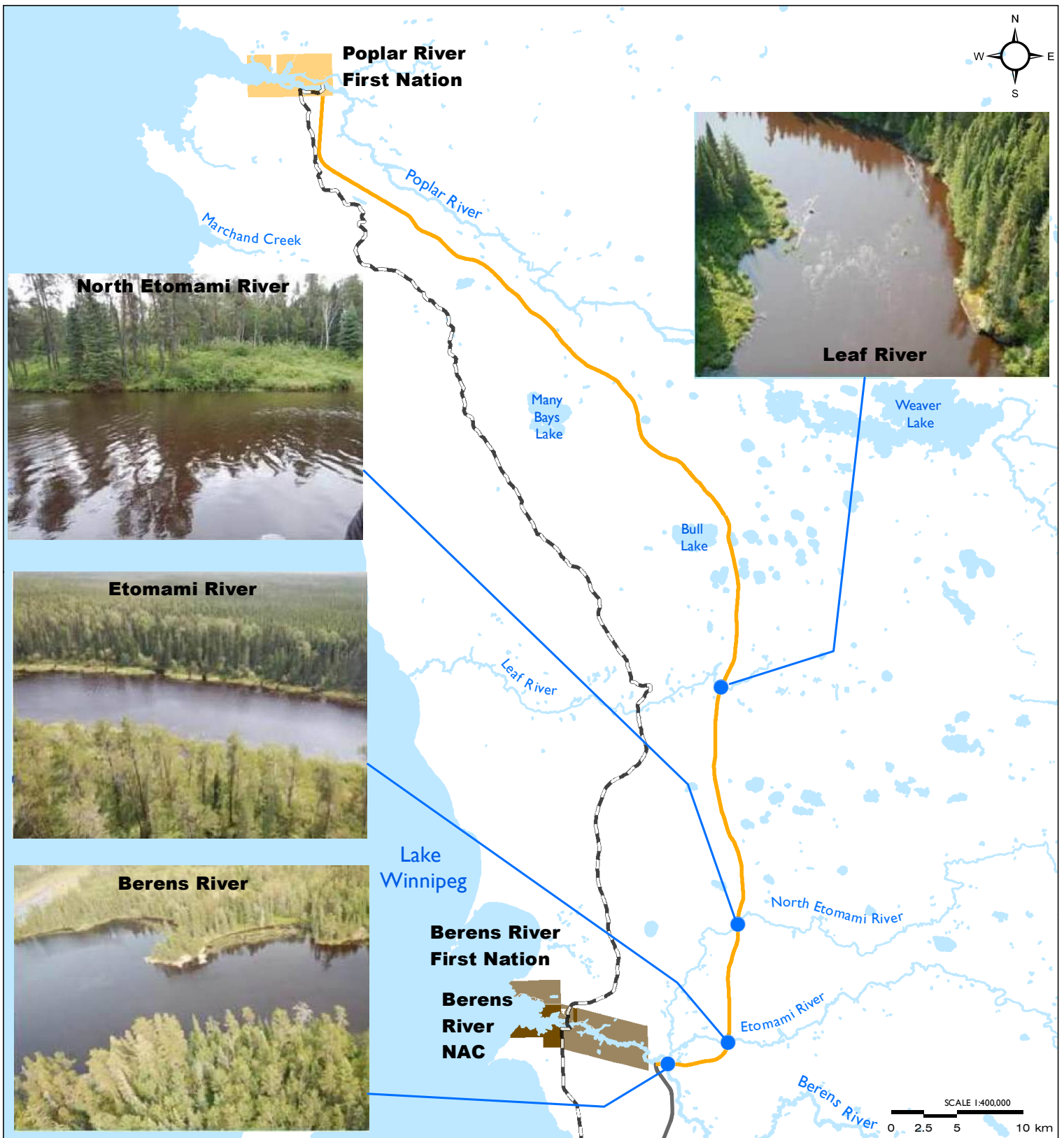
There are no plans to decommission or abandon the Project as it will provide all-season access from Poplar River First Nation to Berens River First Nation and to the southern all-season road network for the foreseeable future (i.e., > 50 years). Decommissioning of temporary components (i.e., staging areas, construction camps, temporary access routes, quarries, and borrow areas not required for on-going road maintenance) will occur as part of the construction phase of the Project. Once no longer required, the existing winter road will be decommissioned by blocking access points and revegetating and restoring disturbed areas, where required.

2.2 Project Components and Activities

The main components of the proposed Project are:

- Gravel-surface two-lane all-season road (94.1 km);
- 4 major water crossings (bridges) over the Berens, Etomami, North Etomami, and Leaf Rivers (see **Figure 3**);
- 6 culvert crossings at fish-bearing watercourse crossings;
- 23 culverts at non-fish-bearing watercourse crossings;
- 284 equalization culverts (estimated) to facilitate drainage/prevent flooding;
- Approximately 3.5 km of temporary construction access routes;
- Approximately 57 ha (0.57 km²) of temporary construction staging areas;
- 4 temporary construction camps covering approximately 64 ha (0.64 km²);
- 13 construction quarry sites;
- Construction borrow areas; and
- Facilities for the storage of explosives.

The total permanent footprint area of the Project, including the all-season road, bridges, culverts, and quarries required for on-going maintenance will be approximately 640 ha. The footprint of cleared areas required for temporary Project components and activities during Project construction such as construction camps, equipment laydown/staging areas, borrow areas, and most quarries is estimated to be less than 340 ha. In total, the Project will therefore result in a permanent and temporary footprint of approximately 980 ha. The footprint area of temporary Project components and activities that will be required only during Project construction will be rehabilitated by natural re-vegetation and seeding/planting.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 5

Locations of Major Bridge Crossings

- P4 All-Season Road Alignment (April 2015)
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- River Crossing
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Berens River Northern Affairs Community

Map Drawing Information:
 ESRI Base Layers, Province of
 Manitoba, CanVec, GeoGratis,
 Dillon Consulting Limited

Map Created By: ECH
 Map Checked By: MG/PS/DM
 Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/8/2016

Staging areas will be located to minimize the amount of clearing required, thereby maximizing road construction efficiency and helping to minimize overall impacts to the environment, construction costs and schedule. Various quantities of raw materials will be required in the construction of the proposed Project. Raw materials will be locally-sourced and obtained from provincial Crown land and Federal Reserve lands, as required (e.g., quarries and borrow areas). All quarry and borrow areas will be located on provincial Crown land as close to the centerline of the proposed road alignment as feasible to minimize the need for temporary access route development and minimize haul distance by heavy construction equipment. It is expected that borrow areas will be within 500 m of the road centreline while quarries may be up to 1 km from the road alignment. The estimated area of borrow areas, quarries and temporary access routes required during the construction phase is 290 ha (2.9 km²).

Key Project activities that will be carried out are outlined in **Table 1**.

Table 1: Description of Key Activities to be Undertaken as Part of the Project

Key Project Activity	Description of Activity
Exploratory clearing	Clearing to be conducted to assist in site access and surveying activities including access for specialized equipment to conduct soil testing.
Right-of-way clearing	Clearing to be associated with areas previously cleared for exploratory work. Right-of-way clearing to be generally 60 m wide and to consist of the removal and disposal of trees, shrubs, fallen timber, and surface litter from the right-of-way and other areas such as borrow areas, prior to grading.
Mechanical brushing	Brushing to involve the removal of brush and small trees in cleared areas within the right-of-way particularly in heavily wooded areas or where conventional mowing equipment cannot access due to rock outcrops, fen/bog areas or slopes.
Blasting	Blasting of rock to occur at specified locations and will be minimized to the extent feasible near sensitive wildlife sites to reduce potential effects.
Grading and gravelling	Activities to include grading earth on the construction site to prepare the roadbed for the roadway. Grading and gravelling to consist of constructing a road grade embankment and the application of traffic gravel on the finish grade surface.
Alterations to linked roadways	The Project will connect to the P1 all-season road at Berens River. The proposed connection of the two roads has already been constructed to both roadway and intersection design standards.
Erosion/sediment control	Appropriate methods will be used to mitigate the potential for erosion and sedimentation as required until vegetation has been established.
Bridge construction	Four bridges will be required along the length of the Project, which will include four basic activities: <ol style="list-style-type: none"> 1. Construction of land-based footings and abutments and in-water piers using reinforced concrete; 2. Steel girder placement across the span of the bridge; 3. Bridge deck construction using reinforced concrete; and 4. Establishment of a gravel surface on the bridge deck.
Culvert installation	Installation of culverts will be completed at six fish-bearing stream crossings, 23 drainage channels, and at 284 topographic low points for drainage equalization. Culvert installation activities will include placing silt fencing and silt curtains, excavating the stream bottom, laying of geotextile material, culvert install and placing and compacting of granular rock fill and road topping.

Key Project Activity	Description of Activity
Closure/reclamation of temporary components	Facilities and work areas including quarry and borrow areas, access routes, staging areas and construction camps that will not be needed for future Project maintenance activities will be demobilized and sites rehabilitated following construction.
Road maintenance	Mowing of vegetation, road surface repairs, drainage preservation (including ditch maintenance), and snow plowing will occur as necessary over the life of the Project. Required road repairs will be undertaken as soon as possible and as soon as conditions permit safe site access.
Bridge/culvert maintenance	Seasonal inspections of culverts and bridge crossings will be conducted to assess and remove build-up of debris caught on piers or at the entrance of culverts to prevent upstream flooding, reduce stress on the structure and allow for fish passage.

Note: Community Benefits Agreements (CBAs) with the east side First Nations communities will provide employment, training and economic opportunities related to road construction and maintenance and other long-lasting economic development opportunities (e.g., hiring of residents of east side communities, training, mentoring, capacity building).

2.3 Project Workforce

Construction will be carried out under contracts tendered and managed by ESRA. It is anticipated that multiple contractors will be engaged concurrently on the Project per ESRA’s Project Management Agreement. As part of ESRA's commitment to ensure that local residents participate in and benefit from the P4 Project, ESRA specifically includes local hiring requirements in construction tenders. A minimum East Side Road Resident (ESRR) participation of 30% is required for road construction tenders and a minimum of 20% for bridge contracts on publically tendered contracts. ESRR represent members of First Nations situated within the boundaries of east side road projects or a resident of one of the communities within the Project boundaries.

Presently, the number and scope of the contracts to support the construction of the P4 all-season road Project are not fully known. During the period of peak construction on the proposed all-season road, an estimated maximum workforce of 120 is anticipated. It is expected that non-local contractor employees, contract administration staff and ESRA staff will travel to the Project site by air, winter road, and/or the newly constructed P1 all-season road terminating at Berens River.

2.4 Project Schedule

Construction of the proposed Project is anticipated to begin in November 2016 and be completed approximately 8 years thereafter (i.e., 2024).

2.5 Environmental Protection Measures

Environmental protection measures are integrated within the development of the Project and describe mitigation specifications and plans that will be implemented throughout the Project design, construction, and the operations and maintenance phases of the Project. Environmental protection measures used in the proposed P4 all-season road are derived from ESRA’s corporate environmental and safety policies and include such measures as: design mitigation measures; Environmental Protection Procedures; detailed construction and operational phase Environmental Management Plans; contract specifications; health and safety protocols; and contractor plans such as the Emergency Response Plan. Collectively these measures are incorporated into the Project’s Environmental Management Plan.

Encompassed within ESRA’s environmental protection measures is a commitment to sustainable development.

ESRA has developed an Environmental Program that addresses all stages of the Project. Design mitigation involves modifying the design of a proposed project to mitigate potential adverse environmental effects at the environmental impact assessment stage prior to completion of the final design and commencement of construction. At this current Planning Phase for the Project, design mitigation has been accomplished by various means including complying with legislation, adopting national and international design standards and codes, adhering to established design guidelines and best management practices, and implementing mitigation measures identified from the environmental impact assessment process.

An Environmental Management Plan (EMP) will be developed by ESRA during the Design Phase and will be submitted to the Environmental Assessment and Licensing Branch of MCWS prior to commencing construction. The EMP provides information and procedures for the P4 Project and for use in future road projects relating to environmental awareness training, environmental protection methods, and site-specific environmental protection procedures to be implemented. ESRA’s Environmental Protection Procedures (EPPs) will also be developed which are designed to provide guidance on environmental protection practices for preconstruction and construction activities. The current EPPs are founded on both best practices and regulatory requirements. Environmental protection is also incorporated into the construction phase through a variety of contract specifications and special provisions and contractor submittals.

3.0 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

As part of the Large Area Transportation Study, a number of alternative transportation modes, in addition to an all-season road system, were considered to service the remote communities on the east side of Lake Winnipeg. These alternative transportation modes represent “alternative means to carry out the Project”. Alternative transportation modes considered were:

- Railway;
- Hovercraft;
- Ferries;
- Airships/dirigibles; and
- Improved winter roads.

Table 2 summarizes the alternative surface and air transportation modes considered for the Project.

Generally, alternative modes considered were not deemed appropriate as a permanent solution when assessed against criteria including cost, reliability, environmental effects, safety and movement flexibility. With regard to the alternative modes of transportation and evaluation considerations listed in **Table 2**, the Large Area Transportation Network Study concluded that the most reliable, safe and

equitable improvement to the existing east side of Lake Winnipeg transportation system would be the construction of an all-season road system supplemented during its development with improved winter roads and permanent bridges where appropriate (i.e., the preferred means for the P4 Project).

In comparison with either the existing system or alternative means such as airships or hovercraft, the rationale for the conclusion of an all-season road network as the best transportation mode and preferred means to carry out the Project includes:

- Greater long-term reliability for safely moving people and goods during all seasons and most weather conditions;
- Greater freedom for people and goods from all east side communities, individuals and businesses to move; and
- More equitable system for travel and trade, on par with the existing all-season road system serving most communities in the province.

Road route selection criteria for the P4 all-season road included consideration of technical aspects, natural environment, social/cultural environment, and capital and maintenance costs.

The proposed Project requires construction of crossings at fish-bearing and non-fish bearing watercourses, and as such, will require the construction of bridges and culverts. Four permanent steel girder bridges are required to provide safe access across the four rivers intersecting the proposed P4 all-season road alignment. The proposed bridge locations were subject to review by aquatic biologists retained to conduct aquatic baseline studies to assess potential impacts and mitigation required as well as input from First Nations community members regarding proposed bridge locations. Culvert design alternatives were considered and appropriate designs selected using guidance from the Manitoba stream crossing guidelines (Fisheries and Oceans Canada and Manitoba Natural Resources 1996), Ducks Unlimited Canada Operational Guides and Best Management Practices for wetland road crossings in boreal forests (Louisiana Pacific *et al.* 2014), applicable Fisheries and Oceans Canada guidelines, and input from First Nations.

Table 2: Alternative Surface and Air Transportation Modes

Transportation Mode	Evaluation Considerations
Railway	<ul style="list-style-type: none"> ▪ Construction cost on a per km basis comparable to that of an all-season road; ▪ Lengthy connections needed to connect to existing railhead/rail line at Wabowden (now decommissioned) and Lac du Bonnet, respectively, duplicate approximately 130 km of existing PR 373 and 110 km of existing Highway 11/PR 304 as well as the P1 all-season road currently being constructed; ▪ Flatter gradients required for rail versus road increases cost and may also be more difficult to maintain rideable profile over fen and bog complexes and rock outcrops; ▪ During construction phase, difficult to offload/reload goods and people at continually advancing rail/winter road interface; and ▪ Less freedom to move than with a road system.

Transportation Mode	Evaluation Considerations
Hovercraft	<ul style="list-style-type: none"> ▪ Suitable over large bodies of open water; ▪ Would likely suffer skirt degradation over fens and bogs; ▪ Damage to the environment over potential multiple routes; and ▪ May damage ice surface during freeze up, potentially breaking ice and creating hazards for snowmobilers.
Airships / Dirigibles	<ul style="list-style-type: none"> ▪ Would need to be very large to haul Transportation Association of Canada maximum highway loadings (Boeing SkyHook Heavy Lift Vehicle [HLV] under development has a maximum payload of 40 tons over a distance of 320 km without refuelling); and ▪ More sensitive than fixed wing aircraft to inclement weather, potentially a significant factor east of Lake Winnipeg (Boeing SkyHook HLV can only operate in winds up to 25 knots).
Ferries	<ul style="list-style-type: none"> ▪ May be appropriate for summer transportation across lakes or rivers as an interim lower cost link in an all-season road system; and ▪ An ice bridge parallel to the ferry route could be used for winter transportation but has potential to break through ice, with safety and environmental degradation risks and implications.
Improved Winter Roads	<ul style="list-style-type: none"> ▪ Shift existing winter road onto firmer ground along a future all-season road route; ▪ Provide permanent bridges at major water crossings along future all-season road route; and ▪ Could be initial phases in development of an all-season road route.

Source: SNC-Lavalin *et al.* 2011a

Potential quarry and borrow areas will be selected using a variety of factors including: availability and suitability of rock and aggregate materials; degree of road bed preparation required; proximity to the proposed road; proximity to bridge and other construction sites; and travel distances for equipment and workers. The selection of final quarry and borrow area locations will consider community input and the goal of minimizing potential adverse effects to environmental, traditional, and heritage resources components.

4.0 ABORIGINAL AND PUBLIC ENGAGEMENT

4.1 Background and Purpose

The Aboriginal and Public Engagement Program (APEP) for the P4 Project is considered a fundamental and influential component of the Project planning processes as it intends to comprehensively engage multiple parties in all phases of the Project. The main objective of the APEP is to provide meaningful opportunities to engage in dialogue and exchange information about the Project with interested and potentially affected parties². This includes east side communities (e.g., local First Nations and NACs), other Aboriginal peoples (Metis) and other interested parties such as government agencies, non-

² Interested and affected parties – Interested parties are defined as Aboriginal and/or non-Aboriginal peoples of Manitoba who may be interested in participating or learning about the Project. Affected parties refer to Aboriginal and/or non-Aboriginal parties who may be directly or indirectly affected by the development of the Project.

government organizations (NGOs) and members of the general Manitoban public. The information received during many conversations with the interested and affected parties is integrated into Project design and the environmental impact assessment. ESRA is committed to working in partnership with local communities, their leadership (i.e., Chief and Council) and Elders to provide engagement processes that reflect the priorities of each community.

The approach for the APEP is centered on:

- Providing participation opportunities for interested and affected parties;
- Addressing relevant biophysical, social, or cultural questions and comments so that they can be considered in relation to Valued Components (VCs) and addressed in the impact analysis section of the EIA;
- Respecting and incorporating community and Traditional Knowledge (TK); and
- Conducting communication between proponent and interested and affected parties in a culturally sensitive and understandable manner (i.e., use of interpreters where required).

Provincial engagement with Berens River First Nation and Poplar River First Nation, and other First Nations communities and Aboriginal peoples on the east side of Lake Winnipeg, regarding sustainable development and a network of all-season roads spans the period of the past 20 years. This history includes a comprehensive engagement program with involvement from Aboriginal and local communities, the general public and stakeholders as well as creating opportunities for other interested stakeholders and the general public.

Throughout the Large Area Network Study and the planning stages of the proposed P4 Project, ESRA has been proactive in engaging and involving Elders, elected officials, and community members of Berens River First Nation and Poplar River First Nations and Berens River Northern Affairs Community. Support for the proposed Project by both First Nations has been demonstrated in forms of agreement with ESRA including Memoranda of Understanding and Community Benefit Agreements (CBAs). ESRA has also engaged with the Manitoba Metis Federation (MMF) during the Project planning stages.

Engagement activities conducted for the proposed P4 all-season road were designed to:

- Provide information about the proposed Project to implement a dialogue with local First Nations communities and other potentially interested and affected parties;
- Gather community and other interested and affected parties input on the proposed Project for consideration early and throughout Project planning and design; and
- Inform community members and other interested and affected parties of ESRA's proposed projects and activities.

The provision of information and the way in which information is communicated and shared is the foundation for an effective engagement program.

4.2 Summary of Engagement

Six rounds of engagement have taken place for the P4 Project thus far, with the first three rounds (i.e., Rounds 1, 2, and 3) focusing on the overall plan for the larger east side of Lake Winnipeg area and the latter three rounds (i.e., Rounds 4, 5, and 6) specifically focusing on the P4 all-season road Project. Rounds 1 to 3 were implemented in partnership with the local communities, were specific to the all-season road network as a whole, and focused on the following exchange of information:

- Round 1 (2009) – Introduction to ESRA and the East Side of Lake Winnipeg Large Area Network Study. Obtained input on baseline information and potential route network options.
- Round 2 (2010) – Discussion of the definition and evaluation of preferred route network options based on technical evaluation and input received from Round 1 and Regional TK studies.
- Round 3 (October 2010 to November 2014) – Discussion of the preferred road alignment within the corridor confirmed in Round 2; obtained input on baseline information and initial design criteria, discussion and refinement of the road alignment.

Following the initial three engagement rounds, three additional rounds (Rounds 4, 5, and 6) of in-community engagement specific to the P4 Project were implemented. Two open houses focusing on the P4 Project were held in Winnipeg for community members living off-Reserve and for the public and other stakeholders. Activities included in Rounds 4, 5, and 6 included:

- Round 4 (April 2015) – Introduction to ESRA; discussion of the findings of the East Side Lake Winnipeg Transportation Initiative and Study; EIA process information; communication of environmental study results; discussion of evolution of proposed road alignment based on community feedback; and obtained input on VCs that should be included or highlighted in the process.
- Round 5 (May 2015) – Summary of Round 4 findings; communication of additional environmental study results; review and discussion of potential Project effects and mitigation measures, and feedback and input on the EIA process and VC selection.
- Round 6 (August to September 2015) – Summary of Rounds 4 and 5 findings; review of preferred road alignment alternative; discussion of potential effects; and preferred mitigation measures, and obtained feedback on the above with a focus on mitigation measures.

Project engagement activities focused on gathering community and stakeholder input regarding key Project components such as the road alignment, bridges, stream crossings, quarries, and borrow areas. Engagement activities also included a review of the construction, operations, and maintenance activities and mitigation measures proposed to avoid or reduce potential environmental effects of the Project. As well as opportunities for economic development and employment related to the Project for local communities, coordination methods were carried out in partnership with the members and associated leadership.

Methods of communication and involvement used for the Aboriginal and public engagement activities for the P4 all-season road Project included:

- Invitation and notification letters (sent via mail, e-mail, and phone calls);
- In-person meetings with targeted audiences (e.g., Aboriginal and local leadership, Elders, governmental agencies, stakeholders);
- In-community meetings/open houses;
- Public open houses;
- Printed material (e.g., newsletters, fact sheets, comment sheets);
- Media (e.g., public announcements, advertisements, updates in Aboriginal newsletters);
- Traditional Knowledge and Traditional Land Use exercises;
- Use of established communication channels (e.g., ESRA website, First Nation radio station, ESRA contact email address and phone and fax numbers); and
- Community member involvement in environmental baseline study data collection.

Table 3 provides a summary of comments received by Aboriginal Groups and stakeholders during engagement and consultation activities as well as the responses by ESRA for each comment.

Table 3: Summary of Key Comments Received and Proponent Responses

Summary of Key Comments Received	Response
Sensitive areas identified along the proposed road alignment - would like the alignment moved away from these areas (avoid and protect).	Community comments have been used to refine the alignment. The proposed road alignment changes have been well received when presented in-community.
Proposed all-season road is important to provide access and services including health care.	Community comments acknowledged by ESRA.
Cumulative effects of the Project in relation to other projects is important.	The EIA will consider cumulative effects.
Sensitive sites and areas should be protected through the consideration of setbacks, and by restricting access.	Sensitive site areas have been considered throughout the EIA and the design phase. They have been used to refine the proposed route alignment and to identify appropriate mitigation through setbacks and restricted access including erecting temporary barriers to prohibit access during construction.
Moose, caribou and their habitats identified as important to the local communities and other stakeholders.	Moose and caribou are identified as VCs in this EIA.
Potential for disturbances to ungulates during construction activities highlighted.	Construction mitigation measures have been developed to minimise disturbance to ungulates.
Potential effects of blasting residue on the food chain, including water and meat of mammals that are regularly consumed by community members, highlighted.	ESRA generally does not blast near water, except at crossings, where DFO regulations are followed. Blasting mitigation (e.g., charge size) will be implemented to minimize potential effects. Blasted rock will not be acid-bearing.
Potential for restrictions to hunting in the area during construction identified.	Hunting restrictions have been identified within the contracts for construction workers around construction sites to protect workers.

Summary of Key Comments Received	Response
Potential effects of increased public access to previously inaccessible areas and natural resources (e.g., moose, fish, mineral extraction) highlighted.	Mitigation measures suggested include avoiding the construction of boat launches and pull off areas and block and allow temporary access trails to rehabilitate to inhibit access by the public. Other measures could include quotas and greater enforcement; however, this is outside of ESRA's ability to implement.
First Nation communities should have access to environmental monitoring reports during construction.	As part of the continuation of the APEP during construction, ESRA will work with the communities to identify the best way to communicate monitoring results and provide reports.
Decision of culverts on creeks used by community members must consider on-going navigation highlighted.	Part of the purpose of gathering TK is to identify travel requirements as well as portages. This information will be used in design and Project planning to better understand the use of the landscape by the communities and to maintain travel routes.
Consideration of sensitive lifecycle stages (i.e. spawning fish) requested.	Required to do so as per the <i>Fisheries Act</i> .
Desire to maintain access for traplines expressed.	ESRA has considered this in the EIA and it is intended that trapline access will be maintained during construction.
Bridges or other river/stream crossing structures should consider continued access by motorized boats, canoes, and snowmobiles.	ESRA has considered this in the EIA. During the in-community meetings and public open houses, how various crossings points continue to be used by the communities was confirmed so that it could be considered during design.
Advance notice of construction should be provided to the communities to allow for cultural and traditional ceremonies to be undertaken prior to the start of work.	Chief and Council will be notified of upcoming contracts prior to their start so that they can coordinate ceremonies if desired.
Ongoing communications with communities is requested as the Project moves forward, such as local land users (e.g., trappers, hunters, plant gatherers) in knowing the location and timing of construction.	ESRA will have a Communications Plan to notify residents. The APEP plan for the Project contemplates on-going communication on Project status to the local communities as well as other interested parties.
Interest in understanding how to get employment information was expressed.	ESRA has a contact that is available to communities for discussing job opportunities. Information was provided at in-community meetings and is also available on the ESRA website and at the local band and community offices.

Additional information and details of the Project APEP is provided in **Chapter 4** of the EIS as well as **Annex A**.

5.0 ENVIRONMENTAL EFFECTS SUMMARY

5.1 Approach to the Environmental Impact Assessment

To evaluate potential environmental effects associated with the Project, the EIA used a step-wise model, which included the following:

1. Selection of VCs potentially affected by the Project on which to focus the EIA;
2. Identification of the potential environmental effects of the Project prior to the implementation of mitigation measures;
3. Initial screening of potential environmental effects to evaluate the level of effect prior to the implementation of mitigation measures;
4. Identification of appropriate mitigation measures and their application to address potential adverse effects; and
5. Prediction of residual adverse environmental effects remaining after mitigation and determining the significance of those residual adverse effects.

Potential Project-related effects considered in this EIA include potential effects on the biophysical environment and potential indirect effects on socio-economic conditions and Aboriginal groups as a result of biophysical changes. Effects that are assessed in relation to human health and safety, socio-economic conditions, and physical and cultural heritage are those effects that are linked to potential changes to the environment resulting from the Project. Human health and safety, socio-economic, and cultural effects assessed as part of this EIA are considered in relation to those communities having the most potential to be affected by the Project (i.e., Poplar River and Berens River First Nations and the Berens River Northern Affairs Community).

Environmental assessment in Manitoba and Canada uses a values-based framework to promote a comprehensive and focused assessment of the potential effects of the proposed Project. This type of framework relies on the use of VCs as a foundation for, and focus of, the environmental assessment. VCs are those components of the natural and human environment that are considered to be of particular importance to several groups in society including Aboriginal Groups, the proponent, technical specialists, and government agencies. VCs represent ecological, physical, economic, social, and cultural aspects of the natural and human environments. The selection of VCs assessed in the EIA follow requirements for the assessment of environmental components indicated in Section 5 of the *Canadian Environmental Assessment Act, 2012*.

Residual effects, which are those effects remaining following the implementation of mitigation measures to avoid or minimize adverse effects of the proposed Project, were also evaluated for each VC. Determining the significance of residual environmental effects involves the consideration and evaluation of specific criteria based on characteristics or attributes of each of the potential effects (e.g., duration of time the effect occurs, magnitude of the effect, spatial extent, frequency, and reversibility of the effect).

5.2 Valued Components

Table 4 outlines the VCs that were selected for the effects assessments and the rationale as to why each of these components was selected. A description of each selected VC is provided in **Sections 5.2.1 to 5.2.19**, including an overview of baseline activities conducted to date, anticipated changes to the environment and associated effects, mitigation measures to address potential effects, and a discussion of potential residual effects that may occur as a result of the Project.

Many other components of the environment were considered in the environmental impact assessment; however, not all were carried forward into the effects assessment as they were not deemed to be of particular importance to Aboriginal peoples, government agencies, or other groups. These components are discussed in the Environmental Impact Statement.

Environmental information for each VC was primarily obtained through: the completion of detailed technical studies; local area Traditional Land Use and Traditional Knowledge studies; published sources; and input received through the Aboriginal and Public Engagement Program regarding this Project.

5.2.1 Study Area Boundaries

For the purpose of assessing the geographic extent of potential Project-related environmental effects that are expected to occur, the following spatial boundaries have been defined for areas within which Project effects may occur:

- Project Footprint – The physical space or directly affected area within which Project components or activities are located and the immediately adjacent area which is the defined limits of the all-season road right-of-way (i.e., 100 m). Permanent and temporary facilities (e.g., temporary access routes and quarries) within which effects are likely to be measurable are also included;
- Local Assessment Area – The area within which direct and/or indirect Project effects are measurable and extending beyond the Project Footprint (see **Figure 4**); and
- Regional Assessment Area – The area beyond the Local Assessment Area within which most potential indirect and cumulative effects would occur (see **Figure 5**).

The Local Assessment Area is the spatial area where measurable changes to environmental components are primarily expected to extend based on the VC being assessed. The boundaries of the Local Assessment Area generally extend five kilometres on either side of the centreline of the proposed all-season road to include the expected area within which measurable potential Project effects on most VCs may occur (e.g., wildlife). However, the boundary of the Local Assessment Area may vary depending on the VC being assessed.

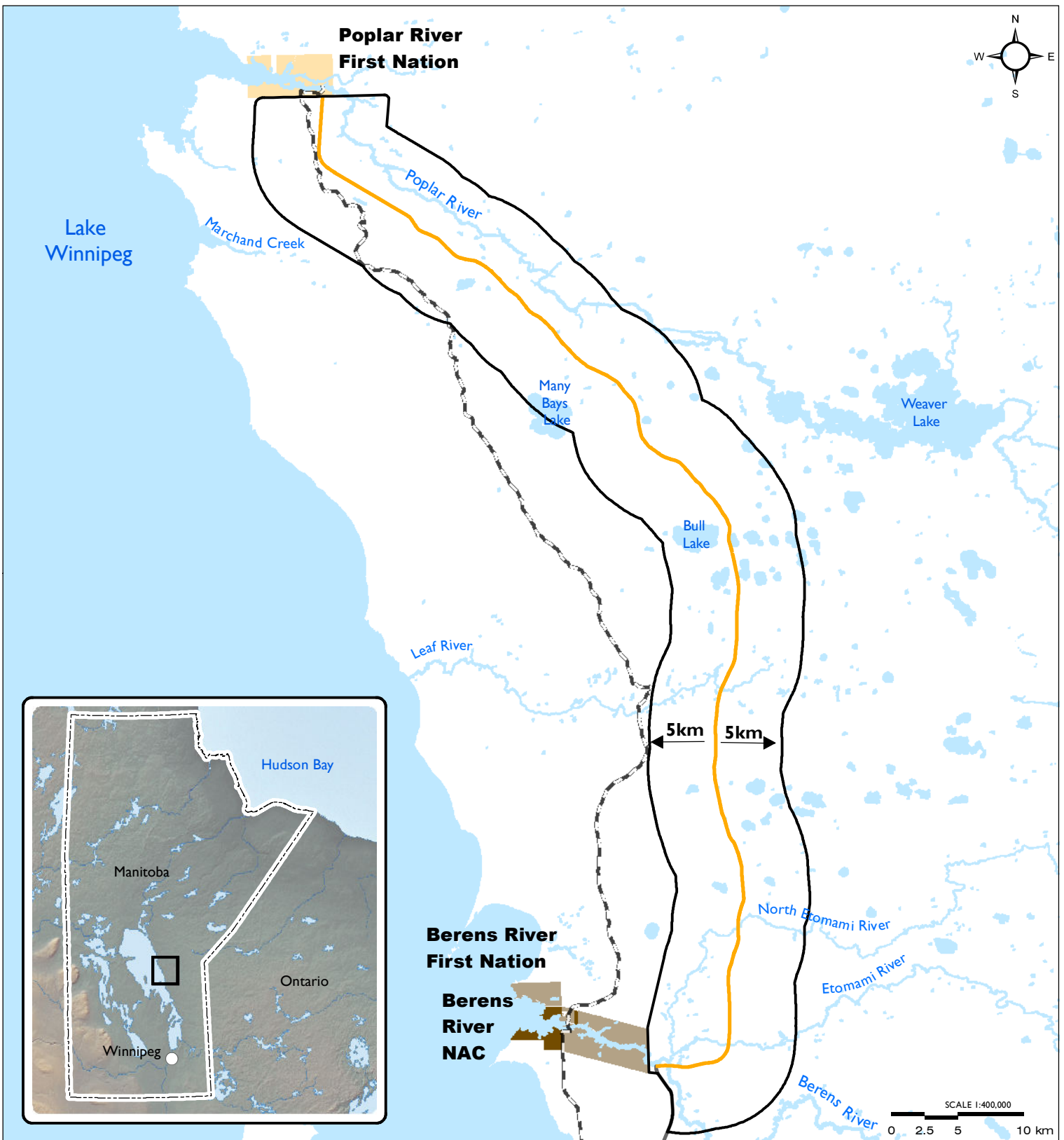
Table 4: Valued Components of the P4 EIA and Rationale for their Selection

Valued Component	Rationale
Physical Environment	
Surface Water	<ul style="list-style-type: none"> ▪ Indicator of human environmental health. ▪ Key measurement indicator for health of aquatic and terrestrial systems and resources. ▪ Linked to traditional Aboriginal activities (e.g., fishing and hunting) which are linked to water quality. ▪ MCWS precautionary note regarding type of rock material and blasting materials used (MCWS, personal communication, January 9, 2015). ▪ Regulated under Manitoba’s <i>The Water Protection Act</i>.
Air Quality	<ul style="list-style-type: none"> ▪ Indicator of changes to human health. ▪ Indicator of the quality and health of biological communities. ▪ Potential effects to climate. ▪ Indicator of changes to the atmospheric environment which CEA Agency Guidelines identify as a VC to be considered for assessment (CEA Agency 2015a). ▪ Manitoba’s Ambient Air Quality Guidelines. ▪ MCWS precautionary note regarding need to adequately address air quality in the EIA (MCWS, personal communication, January 8, 2015).
Noise	<ul style="list-style-type: none"> ▪ Changes in the acoustic environment can be indicative of changes in environmental health. ▪ Indicator of changes to the atmospheric environment which CEA Agency Guidelines identify as an environmental component to be assessed (CEA Agency 2015a).
Aquatic Environment	
Fish Habitat	<ul style="list-style-type: none"> ▪ Supports fish species that are of importance for Aboriginal and local community culture, traditional, and economic activities and values. ▪ Protected under the federal <i>Fisheries Act</i>. ▪ Identified in the CEA Agency Guidelines as a VC to be considered for assessment (CEA Agency 2015a). ▪ Indicator of the productive capacity of aquatic habitats for fish and other aquatic species.
Fish and Harvested Fish	<ul style="list-style-type: none"> ▪ Identified in the CEA Agency Guidelines as a VC (along with fish habitat) to be considered for assessment (CEA Agency 2015a). ▪ Fish are an integral component of the aquatic ecosystem ▪ Of particular value to local communities. ▪ Species include, but are not necessarily limited to, walleye, northern pike, lake whitefish and suckers. These species have been selected for the following reasons: <ul style="list-style-type: none"> ○ Importance for Aboriginal and local community culture, traditional and economic activities and values. ○ Protected under the federal <i>Fisheries Act</i>.

Valued Component	Rationale
Aquatic Species at Risk	<ul style="list-style-type: none"> ▪ Listed as “Endangered” (mapleleaf mussel and lake sturgeon) and “Threatened” (shortjaw cisco) by either the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or in the federal <i>Species at Risk Act</i> (SARA). ▪ CEA Agency Guidelines indicate that ‘Species at Risk’ are to be considered for assessment (CEA Agency 2015a). ▪ Aquatic habitat, including the habitat of Species at Risk, may be altered or removed due to instream activities.
Terrestrial Environment	
Vegetation Communities	<ul style="list-style-type: none"> ▪ Vegetation communities are an integral part of the ecosystem and provide food and habitat for wildlife.
Plant Species of Cultural Importance	<ul style="list-style-type: none"> ▪ Two plant species are selected to serve as representative VCs for Plant Species of Special Interest: <ul style="list-style-type: none"> ○ Flooded jellyskin is Listed as “Threatened” under Schedule 1 of SARA, and “Special Concern” under COSEWIC; <i>Arethusa</i> is ranked S2 (i.e., rare) by the Manitoba Conservation Data Centre; CEA Agency Guidelines indicate that ‘Species at Risk’ are to be considered for assessment (CEA Agency 2015a). ▪ ‘Plant Species of Cultural Importance’ is also a VC due to the importance of various plant species to the local communities.
Ungulates	<ul style="list-style-type: none"> ▪ Two species selected to serve as representative VCs to focus the environmental effects assessment on wildlife: <ul style="list-style-type: none"> ○ Moose - Importance for Aboriginal community cultural and traditional activities; hunting value; large home range; prey for large carnivores. ○ Boreal woodland caribou - Ranked "Threatened" under COSEWIC, Schedule 1 of SARA, and the <i>Manitoba Endangered Species and Ecosystems Act (MBESEA)</i>; large home range requirements; CEA Agency Guidelines indicate that ‘Species at Risk’ are to be considered for assessment (CEA Agency 2015a).
Furbearers	<ul style="list-style-type: none"> ▪ Two species selected to serve as representative VCs to focus the environmental effects assessment on furbearers: <ul style="list-style-type: none"> ○ Beaver - Ecosystem engineer; representative aquatic furbearer. ○ Marten - Harvested furbearer and a valued economic species; important predator/prey species.
Environmentally Sensitive Wildlife Sites	<ul style="list-style-type: none"> ▪ Selected as a VC to represent the nests, dens and/or hibernacula required by some terrestrial species for breeding and/or overwintering requirements. These sites include: bat and snake hibernacula; terrestrial mammal dens (e.g., bears, wolves, wolverine); rookeries; large stick nests; as well as mineral licks.
Migratory Birds	<ul style="list-style-type: none"> ▪ Identified in the CEA Agency Guidelines as a VC to be considered for assessment (CEA Agency 2015a). ▪ Two groups were selected to serve as representative VCs to focus the environmental effects assessment on migratory birds: <ul style="list-style-type: none"> ○ Forest birds (including Canada warbler, common nighthawk, eastern whip-poor-will, olive-sided flycatcher) - listed as "Threatened" or "Special Concern" under COSEWIC, SARA, and the <i>MBESEA</i>; protected under the <i>Migratory Birds Convention Act</i>; some are culturally significant; ○ CEA Agency Guidelines indicate that ‘Species at Risk’ are to be considered for assessment (CEA Agency 2015a). ○ Waterbirds (including trumpeter swan, yellow rail, ducks and geese) - listed as "Threatened" or "Special Concern" under COSEWIC, SARA, and/or the <i>MBESEA</i>; protected under the <i>Migratory Birds Convention Act</i>; some waterbirds have importance for Aboriginal community cultural and traditional activities; hunting value.

Valued Component	Rationale
Herptiles	<ul style="list-style-type: none"> ▪ Common snapping turtle is listed as "Threatened" or "Special Concern" under COSEWIC, SARA, and the MBESEA; culturally significant species ▪ CEA Agency Guidelines indicate that 'Species at Risk' are to be considered for assessment (CEA Agency 2015).
Socio-Economic and Cultural Environment³	
Tourism	<ul style="list-style-type: none"> ▪ Importance for Aboriginal and local community economy. ▪ Identified as a sustainable land use objective in the Poplar River First Nation Land Management Plan (Poplar River First Nation 2011).
Hunting, Trapping, Fishing and Gathering	<ul style="list-style-type: none"> ▪ Importance for Aboriginal and local community cultural, traditional and/or economic activities and values. ▪ First Nations' rights to hunting and fishing are protected under Treaty (Government of Canada 2013). ▪ Regulated under Manitoba's <i>The Wildlife Act</i>.
Travel Routes	<ul style="list-style-type: none"> ▪ May interact with, and potentially be affected by, the proposed Project. Types of travel routes that may be impacted include access to communities, waterways, portages, and other trails. ▪ Importance for Aboriginal and local community culture as well as traditional activities and values. ▪ First Nations' rights to navigation of waterways are protected under Treaty (Government of Canada 2013).
Cultural Heritage and Archaeological Resources	<ul style="list-style-type: none"> ▪ Importance for Aboriginal and local community cultural and traditional activities and values. ▪ Protected under Manitoba's <i>The Heritage Resources Act</i>.
Human Health and Safety	<ul style="list-style-type: none"> ▪ Linked to Section 5 of the Canadian Environmental Assessment Act, 2012 ▪ CEA Agency Guidelines indicate that the EIA should describe how changes to the environment potentially caused by the Project will affect human health (CEA Agency 2015a)

³ The CEA Agency Guidelines for this Project indicate that 'Aboriginal People' should be considered as a VC to be assessed (CEA Agency 2015). The five selected VCs under the Socio-economic and Cultural Environment category represent those VCs that have been identified during the Aboriginal and Public Engagement Program (**Chapter 4**) as particularly valued components that are environmentally-linked to Aboriginal People.



Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 4
Local Assessment Area

- P4 All-Season Road Alignment
- P1 All-Season Road (South of Berens to PTH 304) - Under Construction
- 2013/2014 Manitoba Winter Road
- Local Assessment Area
- Berens River First Nation Reserve
- Poplar River First Nation Reserve
- Berens River Northern Affairs Community

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis,
Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/9/2016
















Project 4 - All-Season Road Connecting Berens River to Poplar River First Nation

Figure 5
Regional Assessment Area

Northern boundary of the Regional Assessment Area follows the northern boundary of the First Nations Protected Area Accord as indicated in the Asatiwisipe Aki Lands Management Plan (Poplar River First Nation 2011). The southern boundary follows the Bloodvein First Nation (FN) boundary to the south, then follows the winter road to Little Grand Rapids FN boundary, then follows that FN boundary to the south, then straight east to the Ontario border from the SE corner of the Little Grand Rapids FN boundary.

- | | | |
|--|---|---|
|  P4 All-Season Road Alignment |  Northern Affairs Community |  Provincial Park |
|  P1 All-Season Road (South of Berens to PTH 304) - Under Construction |  Berens River First Nation Reserve |  Ecological Reserve |
|  2013/2014 Manitoba Winter Road |  Poplar River First Nation Reserve |  Manitoba / Ontario Border |
|  Regional Assessment Area |  Other First Nations | |

Map Drawing Information:
ESRI Base Layers, Province of Manitoba, CanVec, GeoGratis, Dillon Consulting Limited

Map Created By: ECH
Map Checked By: MG/PS/LD
Map Projection: NAD 1983 UTM Zone 14N

DATE: 4/9/2016

5.2.2 Surface Water

Generally, surface water drainage is poor due to the low topographic relief of the area and the widespread occurrence of deep and shallow peatlands. Abundant surface waters flow west to Lake Winnipeg and form part of the Lake Winnipeg East drainage division (Smith *et al.* 1998). The extensive bogs and fens of the Regional Assessment Area provide considerable surface water storage and drain to area creeks, rivers and lakes via small, often undefined drainage paths. Discharge levels are highest during spring and become entirely dependent on precipitation during summer. Water temperatures in these streams may be near 0°C at break-up in April or May, but can rise rapidly to the mid-twenties by late May (North/South Consultants Inc. 2015) depending on annual warming trends.

Consistent with surface water characteristics expected in boreal forest areas, larger waters are “tea-stained” due to the tannins released by decomposing peat at headwaters. Photosynthetic activity is limited by low light penetration through the water column, and local geology, natural acidity, and lack of hardness in surface waters can result in significant concentrations of some metals. Anthropogenic contamination of surface waters in the area is minimal, due to the remoteness of the Project and the absence of human settlement and industrial or commercial development. Surface water is used for potable water in the communities of both Berens River First Nation and Poplar River First Nation.

Field studies were carried out to assess baseline surface water quality in the Project Area at planned major watercourse crossings. Potential effects to surface water are anticipated to be related to Project construction and operations and maintenance activities such as vegetation clearing, equipment set up and use, various in-stream works, concrete use, blasting and debris removal. **Table 5** provides a summary of potential environmental effects on surface water that may occur over the course of the Project and proposed mitigation measures that will be used to reduce potential impacts. Details of the anticipated effects to surface water as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented over the course of the Project are presented in **Chapter 7** of the EIS.

Table 5: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Surface Water

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Alteration of surface drainage patterns in the Local Assessment Area and of stream flow at watercourse crossing locations ▪ Alteration of ice freeze-up/break-up dynamics at watercourse crossings ▪ Temporary increase in suspended sediments/debris and concrete wash water into watercourses. 	<ul style="list-style-type: none"> ▪ Watercourse crossing structures and equalization culverts will be appropriately designed. ▪ Road setbacks from waterbodies (where possible) or vegetation buffers will be required. ▪ Surface water drainage will be directed away from watercourses. ▪ Vegetation clearing will be limited, where possible. ▪ In-stream works will be timed during winter months/low flow, where feasible. ▪ Watercourse existing alignments and gradients will be maintained. ▪ Clearing of riparian vegetation will be limited, where feasible, by hand within 30 m of a watercourse and with clear limits marked.

Potential Environmental Effects	Mitigation Measures
	<ul style="list-style-type: none"> ▪ Stable slash/debris piles and overburden will be stored above high water mark. ▪ Disturbed areas will be stabilized through native plant revegetation or other appropriate means. ▪ Erosion and sediment control (ESC) measures will be implemented until disturbed areas are stabilized and revegetated. ▪ Appropriate procedures will be mandated for fuel storage, dispensing and transferring. ▪ Spills will be contained, treated, disposed of and reported in accordance with applicable provincial regulations and ESRA protocol; spill clean-up kits present on site. ▪ All quarry sites and rock materials used for construction will be inspected for the presence of pyrite/sulphite/iron precipitates; pH and sulphur analyses will be completed when necessary; rock with acid rock drainage potential to affect surface water quality will not be used. ▪ Ammonium-nitrate fuel oil mixtures will not be used in or near watercourses; uncured/partly-cured concrete will be kept in isolation from watercourses. ▪ Blasting will not occur on watercourse shorelines. ▪ Dust suppressants will not be applied to the road within 50 m of watercourses. ▪ Areas for cleaning equipment will be a minimum of 100 m from watercourses and will not drain into them, and equipment used in concrete work will be cleaned away from watercourses.

Following the application of proposed environmental protection specifications and mitigation measures, the predicted residual effects of the Project on surface water are:

- Minor alteration of surface drainage and stream flow at watercourse crossings; and
- Minor alteration of ice dynamics at watercourse crossings.

No significant residual adverse effects on surface water are anticipated to occur as a result of the Project. Water quality will be monitored during in-water works and/or other construction activities conducted near water, as appropriate.

5.2.3 Air Quality

The Project is situated within the Mid-Boreal Ecoclimatic Region which extends from northwestern Ontario to the foothills of the Rocky Mountains (Smith *et al.* 1998). Four seasons with distinct temperature and precipitation regimes occur due to the continental climate, with a relatively short spring and fall, a warm, moderately wet summer, and long cold winters. The air quality of the Regional Assessment Area is expected to be of very high quality as there are no major air pollution sources in the Regional Assessment Area or nearby which could transport emissions into the area by prevailing winds. It is unlikely that air quality is influenced by anything other than small, localized anthropogenic sources from Berens River First Nation and Poplar River First Nation related to on-reserve operation of vehicles and vehicle use of the winter road when open, as the landscape is otherwise undeveloped (**Figure 2**). Air quality in the Regional Assessment Area is impacted on occasion by forest fires.

Air quality of the Local and Regional Assessment Areas can be adversely affected by road construction, operations and maintenance activities through: the generation of air-borne dust/particulates from blasting, burning of cleared trees and shrubs; other construction-related activities; and emissions (including greenhouse gases) produced by vehicle and equipment operations. Potential environmental effects of airborne dust and emissions during Project construction and operations and maintenance phases are expected to be temporary, minor and primarily localized within the Project Footprint and Local Assessment Area. **Table 6** summarizes the potential environmental effects on air quality that may occur over the course of the Project and proposed mitigation measures that will be used to reduce the potential for impacts on the atmospheric environment. Details of the anticipated effects to air quality as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented over the course of the Project construction and operations and maintenance phases are presented in **Chapter 7** of the EIS.

Table 6: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Air Quality

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Release/transport of dust/particulate levels and increased greenhouse gases and VOCs due to machinery use and blasting. ▪ Increased particulate levels and greenhouse gas emissions and reduction of carbon sink. 	<ul style="list-style-type: none"> ▪ Vegetation will be maintained as long as possible. ▪ Disturbed areas will be revegetated with native plant species to minimize erosion/dust generation. ▪ Water and other approved suppressants will be used to control dust. ▪ Quarries, borrow areas and other temporary construction components will be located close to the road corridor to limit construction vehicle travel. ▪ Idling time will be restricted, where feasible. ▪ Routine maintenance of construction equipment/vehicles will be carried out. ▪ Proper storage and handling of fuels will be mandated. ▪ Communities will be contacted to identify timber salvage alternatives to burning; time limits on burning, where feasible. ▪ Dust or smoke-creating works (including blasting) will not take place during high wind conditions. ▪ Guidelines will be followed for explosive materials storage, handling and use (including sufficient setback distances).

Following the application of mitigation measures, the residual Project–related effects remaining for air quality are:

- Minor and localized increase in fugitive dust and particulate levels from vehicles using the road during the construction and operations phases;
- Minor and temporary increase in vehicle/machinery emission levels (greenhouse gases and VOCs) due to Project construction and operations and maintenance activities (e.g., clearing and woody debris burning, blasting, roadbed construction, and maintenance works); and
- Minor loss of carbon sink for atmospheric carbon storage through removal of vegetation required for the all-season road, quarries, and on-going maintenance).

No significant adverse residual effects on air quality are anticipated to occur as a result of the Project following the implementation of mitigation measures.

5.2.4 Noise and Vibration

Due to the absence of human settlement or development in the Regional Assessment Area anthropogenic noise in the vicinity of the Project is extremely limited and restricted to local sources such as airplanes, vehicles on First Nation reserve roads, vehicular traffic along the winter road and snowmobile and ATV traffic on trails (Poplar River First Nation 2011). Vibration in the Regional Assessment Area occurs infrequently and is exclusively associated with blasting activities occurring at operating quarries. The highest levels of sustained noise originate from Poplar River First Nation and Berens River First Nation communities at the north and south termini of the all-season road. Few human receptors to noise and vibration are present in the Regional Assessment Area, with the majority located within the communities of Berens River First Nation, Berens River NAC, and Poplar River First Nation.

Noise will be generated by construction traffic and use of machinery during construction of the Project. In addition, blasting of rock in particular can be a substantial short-term source of noise and vibration during road construction that can vary in intensity and distance of effect depending on site-specific characteristics and conditions such as type of soil and terrain, vegetation cover, and wind conditions (RWDI 2015). **Table 7** details the potential environmental effects of noise and vibration that may occur over the course of the Project and proposed mitigation measures that will be used to reduce the potential for impacts. Details of the anticipated effects to noise and vibration as a result of construction as well as specific mitigation measures that will be implemented over the course of the Project are presented in **Chapter 7** of the EIS.

Given that the distance of the all-season road and potential quarry areas from the nearest residences in the Poplar River First Nation and Berens River First Nation communities, adverse effects of noise and vibration on local communities during to the operations and maintenance phase are not expected.

Table 7: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Noise and Vibration

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Increased noise associated with the use of vehicles and machinery. ▪ Increased noise and vibration as a result of blasting activities. 	<ul style="list-style-type: none"> ▪ Noise-reducing components will be fitted with factory-installed noise-reducing components, where feasible, and will be maintained. ▪ Explosives will be detonated at sufficient setback distances to control noise/vibration effects to communities. ▪ Industry best practices will be used for blasting activities, including scheduling when in the vicinity of sensitive wildlife sites. ▪ Forest buffers will be retained around quarries to reduce noise, where feasible.

A temporary sensory disturbance to local human receptors due to noise and/or vibration generated by construction and operations and maintenance Project phases is predicted as a minor residual effect of the Project. No adverse residual effect of noise or vibration on human health and safety is expected. This residual effect is not predicted to be significant due to the considerable distance between the noise/vibration source(s) and Berens River First Nation and Poplar River First Nations Reserves, the short-term and intermittent occurrence of noise events related to Project construction and operations and maintenance, and the low traffic volumes expected during Project operations and maintenance.

5.2.5 Fish Habitat

The aquatic environment in the Local Assessment Area includes a range of ephemeral, intermittent and perennial watercourses that provide a variety of low to high quality fish habitat. In general, fish habitat quality and species diversity increase as the size of the watercourse and permanence of flow in the watercourse increases. Exceptions to this generality occur when there are barriers within the watercourse that affect flow patterns or fish movements (e.g., beaver dams and waterfalls). A total of 42 fish species from 16 different families are known to occur in local watercourses. The major river crossings are known to support species that are part of, or support, a Commercial, Recreational or Aboriginal (CRA) fishery (e.g., northern pike, sucker species, and walleye). Other species of note include the channel catfish which is the known fish host for the temporary parasitic stage of larvae (i.e., glochidia) of the mapleleaf mussel, which is a Species at Risk.

To characterize and describe the existing aquatic environment, detailed aquatic environmental desktop and field studies were conducted to assess aquatic habitat potentially affected by the Project. The P4 Project will require several watercourse crossings at fish-bearing watercourses, including multi-span bridges, large diameter culverts (>900 mm), and other culverts (minimum 900 mm diameter). Equalization culverts will be also installed at non-fish-bearing watercourse crossings. Installation and construction of these watercourse crossings, as well as Project activities in close proximity to fish-bearing streams, may result in changes to fish habitat.

Activities that may affect fish habitat (as well as harvested fish species and aquatic Species at Risk include): vegetation clearing; construction equipment set up and use; various in-stream works; vehicle and machinery use; blasting; solid and liquid waste management, storage, and handling of hazardous materials; creation of temporary crossings; repairs; and debris removal.

Table 8 summarizes the potential environmental effects on fish habitat that may occur over the course of the Project and the proposed mitigation measures that will be used to reduce potential impacts. Details of the anticipated effects to fish habitat as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented during these phases are presented in **Chapter 8** of the EIS.

Table 8: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Fish Habitat

Potential Environmental Effects	Key Mitigation Measures
<ul style="list-style-type: none"> ▪ Permanent alteration/ destruction of instream habitat. ▪ Permanent alteration/ destruction of riparian zone habitat. 	<ul style="list-style-type: none"> ▪ The amount of area to be permanently altered/destroyed had been minimized to the extent feasible as part of the watercourse crossing designs. ▪ Riparian vegetation clearing within the right-of-way will be limited to the removal of trees and tall shrubs (to maintain line of sight safety requirements) with no removal of low growing vegetation beyond the road surface and shoulder. ▪ Clearing limits will be clearly marked prior to riparian vegetation removal to avoid unnecessary damage to or removal of vegetation. ▪ Clearing within 30 m of a watercourse shall be by hand. ▪ Disturbed areas will be stabilized through revegetation with native plant species or other appropriate means (e.g., erosion control blankets) following completion of the works. ▪ Instream construction activities conducted in fish bearing watercourses will be timed to avoid fish spawning and incubation periods in spring (April 1-June 15), summer (May 1-June 30), and fall (September 15-April 30). ▪ Instream construction will be conducted in isolation from flowing water to mitigate downstream sediment transfer (e.g., with the use of cofferdams, channel diversions and silt curtains). ▪ A fish salvage will be conducted within the isolated work area of fish-bearing watercourses prior to the commencement of instream work. ▪ Temporary and permanent structures will avoid critical Species at Risk habitat, where feasible, and species surveys with relocation will be conducted if required.

Following the application of the mitigation measures outlined above, the residual effects remaining for fish habitat are predicted to be:

- The permanent destruction of 180 m of riparian habitat during construction; and
- The permanent destruction of 206.5 m² of instream habitat during construction.

The permanent destruction of riparian and instream fish habitat at the crossings is unavoidable due to the footprint of the in-water piers and culverts. If required, fish habitat may be created to offset these unavoidable losses. With the use of appropriate mitigation measures, resource management, Best Management Practices and environmental protection plans, the residual effects on fish habitat are expected to be not significant.

Follow-up and/or monitoring activities will be conducted over the course of the Project to confirm that mitigation measures are successful in preventing significant adverse residual effects on fish habitat.

5.2.6 Fish and Harvested Fish

As mentioned in **Section 5.2.4**, major river crossings in the Project area are known to support fish communities that include species involved with a CRA fishery (e.g., lake sturgeon, lake whitefish, northern pike, sucker species, and walleye). Lake sturgeon is both a harvested species in the region and an aquatic Species at Risk (see **Section 5.2.6** for more information). Workshops and interviews conducted with Berens River First Nation and NAC and Poplar River First Nation community members identified fish species harvested in the area. Members from both communities indicated that fish are harvested for food, income, and cultural purposes.

Potential effects of the Project on fish and harvested fish and mitigation measures to reduce the potential of these effects are anticipated to be the same as those listed for fish habitat noted in **Section 5.2.4**. Improved access could also result in increased fishing opportunities in waterbodies at watercourse crossing sites along the proposed route where fishing currently occurs (e.g., Berens River) and in waterbodies not previously or conveniently accessible for fishing. To mitigate potential effects of improved access and increased fishing pressure, the following mitigation measures are included in those implemented during Project construction and operations and maintenance:

- Construction access routes and winter roads will be decommissioned and rehabilitated;
- Unnecessary access to sensitive areas by work crews will be prohibited;
- Access to major watercourse crossings along the proposed P4 all-season road route will be restricted using measures such as slope treatments, boulders, guardrails and other public safety measures; and
- Application of existing Province of Manitoba fisheries management actions (e.g., restrictions on fishing periods, use of catch and release only, limits on allowable catch and licenses, conservation closures).

There are no residual effects to fish and harvested fish.

5.2.7 Aquatic Species at Risk

Three aquatic Species at Risk⁴ were identified within the local Project area. These aquatic Species at Risk include lake sturgeon, mapleleaf mussel and shortjaw cisco. Of the watercourses crossed by the proposed Project, lake sturgeon and the mapleleaf mussel are known to occur only in the Berens River. Shortjaw cisco prefers deep areas of lakes and is likely not present within the watercourses crossed by the proposed P4 Project. Lake sturgeon are a managed species in Manitoba (MCWS 2012) and under the current Fishery Regulations, all lake sturgeon caught by recreational angling or commercial fishing must be released to them from incidental or unintentional harvest (MCWS 2012).

⁴ Species at risk, for the purpose of this EIA, are considered to be: all federal aquatic species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for listing on Schedule 1 of the *Species at Risk Act*, including aquatic species in the risk categories of extirpated, endangered, threatened and special concern (Canadian Environmental Assessment Agency [CEAA] 2015); provincial aquatic species listed as Endangered or Threatened under *The Endangered Species and Ecosystems Act* of Manitoba (MBESEA); and aquatic species listed as very rare (provincial status of S1) or rare (provincial status of S2) throughout their range as listed by the Manitoba Conservation Data Centre (MCDC 2015).

Potential effects of the Project on aquatic Species at Risk are anticipated to be the same as those listed for fish habitat as noted in **Section 5.2.4**. Mitigation measures that will be implemented to reduce potential effects on aquatic Species at Risk will be similar to those presented in **Section 5.2.4**, and are:

- Temporary and permanent structures will avoid critical Species at Risk habitat, where possible; and
- If mapleleaf mussel relocation is required during Project construction, the relocated mussels will be monitored for growth and survival (as per discussions with Fisheries and Oceans Canada).

There are no residual effects to aquatic Species at Risk.

5.2.8 Vegetation Communities

The vegetation communities in the Project study areas consist of a number of types of coniferous and deciduous trees, with an understory consisting of several species of shrubs, forbs, grasses, lichens and other vascular and nonvascular plants. Within the Project Footprint, Local and Regional Assessment Areas, 11 vegetation classes that occur within and are comprised mainly of bog and fen complexes and including: tall shrub; different types of wetland areas; coniferous, broadleaf and mixedwood forests; water; and exposed land. Information collected during the baseline field and desktop studies was used to characterize the vegetation communities in the Project study areas and provide an assessment of potential effects on vegetation communities in relation to the proposed Project.

Potential effects on vegetation communities may be related to Project construction and operations and maintenance processes such as vegetation clearing, vegetation management, release of hazardous substance, introduction and spread of non-native and invasive plants, and increased risk of forest fire. **Table 9** summarizes the potential environmental effects that may occur over the course of the Project and proposed mitigation measures that will be used to reduce the potential for impacts on vegetation communities. Details of the anticipated effects to vegetation communities as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented over the course of the Project are presented in **Chapter 9** of the EIS.

Table 9: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Vegetation Communities

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Introduction and spread of non-native and invasive species in the Local Assessment Area ▪ Loss or impairment of vegetation communities and/or plant species of cultural importance in the Project Footprint 	<ul style="list-style-type: none"> ▪ Clearing and construction activities will be performed in winter months where feasible. ▪ Construction equipment will be cleaned prior to bringing them to the work area. ▪ Restoring of ground cover vegetation using natural means, augmenting with planting and seeding of native plants, as required. ▪ Further assessment and protection measures for appropriate Species at Risk will be conducted. ▪ Granular materials obtained on-site or using a nearby local quarry will be used. ▪ Limiting vegetation clearing to designated areas within the Project Footprint.

Following the application of mitigation measures, the residual Project-related effects remaining for vegetation communities are:

- A minimal loss or impairment of vegetation communities; and
- A minimal risk of the introduction and spread of non-native and invasive species.

Following the use of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual effects on vegetation communities are anticipated to occur as a result of Project development.

5.2.9 Plant Species of Cultural Importance

Over 450 vascular and non-vascular native plant species from over 80 families potentially occur in the terrestrial and aquatic habitats of the Local and Regional Assessment Areas. Various literature reviews and field studies were undertaken to confirm the plant species of conservation concern present within and surrounding the Project Footprint. The term “species of conservation concern” includes species that are rare, disjunct, or at risk throughout their range or in Manitoba and in need of further research. The term also encompasses species that are listed under *MBESEA* or that have a special designation by COSEWIC. No vegetation Species at Risk occur in the Lac Seul Uplands Ecoregion, with the exception of the lichen flooded jellyskin. Baseline field studies conducted in June 2015 for the proposed Project included surveys for plant species of cultural importance as well as other species of conservation concern. The orchid *Arethusa* was observed in the vicinity of the sampling plots, one of which was within the Project Footprint. As part of the baseline field studies, 36 plant species with edible, medical, or cultural value to local communities were observed in the vegetation Local Assessment Area.

Potential effects on plant species of cultural importance may be related to Project construction and operations and maintenance are anticipated to be the same as those identified for vegetation communities (e.g., vegetation clearing, vegetation management, release of hazardous substance, introduction and spread of non-native and invasive plants, and increased risk of forest fire). In addition to the potential effects identified for vegetation communities in **Table 9**, the Project may result in a loss or impairment of desirable plant species within the Project Footprint. Details of the anticipated effects to plant species of cultural importance as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented over the course of the Project are presented in **Chapter 9** of the EIS.

As discussed for vegetation communities, no significant effects on vegetation, including plant species of cultural importance, are anticipated to occur as a result of the Project. A potential beneficial effect of the operation of the all-season road is the provision of increased access to new areas of edible, medicinal, and cultural plants by local community members.

5.2.10 Ungulates

The ungulate species and populations represented in the area are distributed across much of forested Canada and are common within the boreal forest of the Local Assessment Area. The P4 Local Assessment Area provides excellent habitat for boreal woodland caribou and moose. Ungulates are important for food and cultural purposes, play a key role in the local ecosystem and are of high hunting value (i.e., moose). Boreal woodland caribou are ranked as “Threatened” under COSEWIC, Schedule 1 of SARA, and the *MBESEA*.

Ungulate studies, as well as broader wildlife investigations, were conducted in the Regional Assessment Area to identify Species at Risk, assess habitat types, and complete habitat modelling. As part of the wildlife studies, grey wolf populations were also monitored, as they are the primary predator in the area. Potential effects on wildlife and habitat may occur as a result of Project construction and operations and maintenance activities such as vegetation clearing, equipment set up and use, various in-stream works, blasting, and collisions with vehicles. **Table 10** summarizes the potential environmental effects that may occur over the course of the Project and proposed mitigation measures that will be used to reduce the potential for impacts on ungulates. **Chapter 9** outlines the anticipated effects to ungulates resulting from construction and operations and maintenance phases as well as specific mitigation measures that will be implemented during Project phases.

Table 10: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Ungulates

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Habitat loss, alteration or fragmentation of existing habitat. ▪ Temporary sensory disturbance due to construction and operations and maintenance activities. ▪ Habitat gain due to decommissioning and regeneration of vegetation of temporary access routes and winter road. 	<ul style="list-style-type: none"> ▪ Design mitigation measures for habitat and safety will be applied. ▪ All-season road will be routed to avoid high quality habitat where feasible. ▪ Limiting riparian vegetation clearing to the removal of trees/tall shrubs. ▪ Noise, light and dust suppression techniques will be applied. ▪ Water flow, levels, and wetland hydrologic regimes will be maintained. ▪ Existing access trails or cut lines will be used where feasible. ▪ The existing winter road and temporary access routes will be decommissioned. ▪ Mineral licks will be identified and included as Environmentally Sensitive Sites. ▪ The road corridor will be restricted to construction personnel and firearms prohibited during construction. ▪ Wildlife awareness signs and speed limits will be posted as/where required. ▪ Dust suppression techniques will be applied.

Following the application of mitigation measures, the residual Project-related effects remaining for ungulates are:

- Loss, alteration or fragmentation of habitat;

- Temporary sensory disturbance; and
- Reduction of habitat loss or alteration (e.g., habitat gain).

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on ungulates are anticipated to occur as a result of the Project. To determine if the predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be conducted, as necessary.

5.2.11 Furbearers

Furbearing mammal species that occur in the vicinity of the P4 all-season road are those species typical of the boreal landscape such as beaver and marten. These two species were selected to serve as representative VCs as their life requisites represent two broad and ecologically distinct habitat types that provide habitat for other furbearing species. Beaver represent riparian areas which are important to many wildlife species with marten habitat associated with mature and intact forest. Both species are extensively trapped by local community members.

Field studies, including extensive monitoring programs, were carried out to assess important terrestrial and aquatic furbearer habitat. Information regarding the effects of furbearers on the ecology of the area was also considered in baseline data collection. Potential effects to furbearers and associated habitat may be associated with Project construction and operations and maintenance activities. **Table 11** provides a summary of the potential environmental effects that may occur over the Project development phases and proposed mitigation measures that will be used to reduce the potential for impacts on furbearers. **Chapter 9** provides a more detailed description of anticipated effects to furbearers as a result of construction and operations and maintenance phases as well as specific mitigation measures that will be implemented during these phases.

Table 11: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Furbearers

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Habitat loss, alteration and fragmentation due to construction and operations and maintenance activities. ▪ Temporary sensory disturbance due to construction and operations and maintenance activities. ▪ Habitat gain due to decommissioning and regeneration of vegetation of temporary access routes and winter road. 	<ul style="list-style-type: none"> ▪ Design mitigation measures for habitat and safety will be applied. ▪ Dens will be marked as Sensitive Sites and isolated. ▪ Dust suppression techniques will be used. ▪ All-season road will be routed to avoid high quality habitat. ▪ Riparian vegetation clearing will be limited to trees and tall shrubs (for line of sight safety requirements). ▪ ESC measures will be implemented. ▪ Water flow, levels and wetland hydrologic regimes will be maintained.

Following the application of mitigation measures, the predicted residual effects of the Project for furbearers are:

- Loss, alteration or fragmentation of habitat;
- Temporary sensory disturbance; and
- Reduction of habitat loss or alteration (e.g., habitat gain).

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on furbearers are anticipated to occur as a result of the Project. To determine if predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be performed as necessary.

5.2.12 Environmentally Sensitive Wildlife Sites

Ecologically sensitive wildlife sites include bat and snake hibernacula, terrestrial mammal dens, rookeries, large stick nests, animal dens and mineral licks. These wildlife sites provide critical wintering and breeding habitat for several key species including bears and also provide species fidelity to dens and nest.

Investigations of environmentally sensitive wildlife sites were completed and wildlife surveys were also completed to provide information regarding sensitive wildlife sites. Ecologically sensitive wildlife sites may be impacted as a result of Project construction and operations and maintenance activities. **Table 12** presents a summary of potential environmental effects that may occur over the course of Project construction and operations and proposed mitigation measures that will be used to reduce the potential for impacts on ecologically sensitive wildlife sites. **Chapter 9** presents a more detailed discussion of the anticipated effects to ecologically sensitive wildlife sites as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented during these Project phases.

Table 12: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Ecologically Sensitive Wildlife Sites

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Loss, alteration or physical disturbance to sites due to construction and operations and maintenance activities. ▪ Temporary sensory disturbance due to construction and operations and maintenance activities. ▪ Habitat gain due to decommissioning and regeneration of vegetation of temporary access routes and winter road. 	<ul style="list-style-type: none"> ▪ Design mitigation measures for habitat and safety will be applied. ▪ Mineral licks and other important sites will be included into EPPs as Environmentally Sensitive Sites. ▪ Existing access trails or cut lines will be used to the extent feasible. ▪ Surveys will be conducted for ecologically sensitive sites prior to construction; marking, isolation and setbacks implemented if these sites are found.

Following the application of mitigation measures, the predicted residual effects of the Project for ecologically sensitive wildlife sites are:

- Loss, alteration, or physical disturbance of sites.
- Temporary sensory disturbance.
- Reduction of habitat loss or alteration (e.g., habitat gain).

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on ecologically sensitive wildlife sites are anticipated to occur as a result of the Project.

5.2.13 Migratory Birds

Over 220 bird species potentially occur in the Local Assessment Area at different periods of the year. Of these bird species, many forest birds and waterbirds are migratory. Migratory birds within the Local Assessment Area that are considered Species at Risk by being designated or listed under COSEWIC, SARA, and/or MBESA include: common nighthawk, eastern whip-poor-will, olive-sided flycatcher, short-eared owl, least bittern, yellow rail and trumpeter swan. The assessment of migratory birds considered these species at risk as well as 9 species that were studied and modelled as well as over 80 other bird species that occur in similar habitat types (Joro 2005).

A combination of Autonomous Recording Units (ARUs) and ground-based pedestrian surveys were used to collect information on the migratory bird species (both forest birds and waterbirds) present in the Local and Regional Assessment Areas. Migratory birds may be impacted by construction and operations and maintenance activities. **Table 13** summarizes the potential environmental effects of the Project that may occur during routine vegetation management in the right-of-way and proposed mitigation measures that will be used to reduce the potential for impacts on migratory birds. **Chapter 9** presents more detail regarding the anticipated effects to migratory birds as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented over the construction and operations and maintenance phases of the Project.

Table 13: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Migratory Birds

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Habitat loss, alteration, and fragmentation. ▪ Localized areas of temporary sensory disturbance. ▪ Habitat gain due to decommissioning and regeneration of vegetation of temporary access routes and winter road. 	<ul style="list-style-type: none"> ▪ All-season road will be routed to avoid high quality habitats and sensitive areas to the extent feasible. ▪ Rehabilitation of trails and winter roads to offset habitat loss. ▪ Disturbed areas will be reclaimed to encourage natural growth. ▪ Dust suppression techniques will be maintained. ▪ A vegetated buffer zone will be retained between the all-season road and lakes or ponds along the right-of-way. ▪ Existing water flow, levels and wetland hydrologic regimes will be maintained. ▪ Conduct pre-clearing migratory bird nest surveys during the nesting season; if nests found, they will be marked and isolated as Sensitive Sites

	and setbacks from construction activities will be implemented to the greatest extent feasible. Nesting periods will be avoided where possible.
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Following the application of mitigation measures, the predicted residual Project-related effects on migratory birds are:

- Loss, alteration, or fragmentation of habitat;
- Temporary sensory disturbance; and
- Reduction of habitat loss or alteration (e.g., habitat gain).

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on migratory birds are anticipated to occur as a result of the Project.

5.2.14 Herptiles

There are 14 species of amphibians and reptiles (i.e., herptiles) documented to be present within the Local and Regional Assessment Areas, including toad, salamander, turtle, and snake species (Joro 2015; Manitoba Herptiles Atlas 2015). Herptile species are important predators and prey in the boreal forest ecosystem, and spend all or portions of their life cycle in aquatic environments. The common snapping turtle was the only herptile Species at Risk was identified to be potentially present in the Local Assessment Area. Information for this species was obtained from the Canadian Herpetological Society (2015), COSEWIC (2008), the Manitoba Herptiles Atlas (2015), and the Species at Risk Public Registry (SARA 2015).

Herptile presence or absence was determined based on field studies conducted in the area, review of habitat data and professional knowledge and experience in the area. Potential changes to herptiles and associated habitats are anticipated to be related to construction and operations and maintenance processes such as vegetation clearing, culvert installation and maintenance, and quarry and borrow area development. **Table 14** provides a summary of potential environmental effects that may occur during Project construction and operations and maintenance, and proposed mitigation measures that will be used to reduce the potential for impacts on herptiles. **Chapter 9** provides detail of the anticipated effects to herptiles as a result of the construction and operations and maintenance phases as well as specific mitigation measures that will be implemented during these Project phases.

Following the application of mitigation measures, the predicted residual effect on herptiles is increased mortality due to vehicle collisions.

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on herptiles are anticipated to occur as a result of the Project.

Table 14: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Herptiles

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Loss or alteration of breeding or rearing habitat. ▪ Temporary sensory disturbance due to construction and operations and maintenance activities located near suitable herptile habitat. ▪ Increased mortality due to vehicle collisions. 	<ul style="list-style-type: none"> ▪ Application of design mitigation measures. ▪ Vegetation clearing activities will be limited and conducted during late fall and winter to the extent feasible. ▪ Existing water flow patterns, levels and hydrologic regimes will be maintained. ▪ Culvert installation will provide alternate passage routes. ▪ Wildlife warning signs will be installed where/as required. ▪ Vegetated buffer zones will be maintained between the road alignment and waterbodies. ▪ Appropriate erosion and sediment control measures will be in place and lasting until disturbed areas are stable.

5.2.15 Tourism

The Regional Assessment Area is described as having wilderness backcountry tourism and associated outdoor recreation opportunities which include snowmobiling, ATV use, boating/canoeing, lodging/camps, back-country camping, fishing and hunting. There is some limited eco-tourism in the area. The Berens River is a chartered wilderness canoe route and Poplar River draws canoeists to a lesser degree. The Leaf River, Etomami and North Etomami are not considered recreational canoeing routes. Berens River currently has several businesses that support the tourism industry: Berens River Lodge; North Country Lodge; Berens River Log Inn; and the Barra Inn. Traditional lands east of Berens River have natural attributes that support the potential growth for eco-tourism including excellent routes for canoe travel, as well as fishing opportunities. Tourist accommodation in Poplar River First Nation is limited to the Sagatay Lodge although the community envisions future development in tourism. The increased accessibility provided by the Project could provide additional interest and opportunity for tourism in both communities.

Regional tourism and associated recreation opportunities are currently found at sites including Nopiming Provincial Park, Atikaki Provincial Park, and the Bloodvein (Canadian Heritage) River. The east side of Lake Winnipeg also has a number of sport fishing and hunting lodges and outfitters, and is supported by the Eastern Manitoba Tourism Association that assists in the promotion of tourism in the area. There is considerable history for support of tourism and recreation on the east side of Lake Winnipeg.

The potential environmental effects on tourism associated with Project construction activities are linked to the potential effects on the environmental components (e.g., fisheries resources, hunted animals such as moose) and access to those resources that tourism depends on. **Table 15** provides a summary of potential environmental effects that may occur during Project construction and operations and maintenance, and proposed mitigation measures that will be used to reduce the potential for impacts

on tourism. **Chapter 10** of the EIS presents additional detail regarding anticipated effects and specific mitigation measures that will be implemented over the course of the Project.

Table 15: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Tourism

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Reduced interest in tourism activities due to temporary disturbance from construction activities. ▪ Reduced access to major waterways associated with boating and canoeing associated with tourism during construction 	<ul style="list-style-type: none"> ▪ Setback of all-season road from Poplar River. ▪ Limiting construction to work areas. ▪ Measures to protect wildlife will minimize adverse effects to hunting success. ▪ Measures to protect fish and fish habitat will minimize adverse effects to recreational fishing success. ▪ Navigation access to be retained during construction. ▪ Watercourse crossings to be designed for boat passage or to include portages.

Following the application of mitigation measures, the predicted residual effects of the Project for tourism are:

- Temporary reduced interest in tourist activities due to temporary disturbance of tourism-related activities in the Local or Regional Assessment Areas.
- Potential for increased tourism in the Local Assessment Area due to road access.

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on tourism is anticipated to occur as a result of the Project. To determine if predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be performed as necessary.

5.2.16 Hunting, Trapping, Fishing and Gathering

Hunting, trapping, fishing, and gathering are cultural and traditional activities widely practiced by community members in the Regional Assessment Area and on the east side of Lake Winnipeg. Hunting is a cultural activity widely practiced by community members of the Regional Assessment Area. Game hunting areas are provincially-designated zones under which certain hunting conditions apply (e.g., hunting seasons, bag limits, and other restrictions and regulations) however they do not apply to Aboriginal Peoples under their Treaty and Constitutional rights. Trapping is a traditional activity that is actively practiced by many community members in the Regional Assessment Area. In addition to the cultural connection that trapping provides to the land within the traditional territories of Aboriginal Peoples, commercial trapping also occurs as a source of employment and income, and in some cases, country foods. Fishing is an important year-round traditional activity for the members of the two local communities as well as Metis of the area. Fishing takes place on Lake Winnipeg as well as on the many rivers and lakes within the Regional Assessment Area. Commercial fishing activities occur in Lake

Winnipeg with subsistence activities occurring in the rivers as well as Lake Winnipeg. Gathering of food (e.g., berries) and medicinal plants is a traditional activity practiced by many community members in the Regional Assessment Area and provides a cultural connection to the land.

The proposed Project has the potential to affect traditional hunting, trapping, fishing and gathering activities by members of the local communities as well as the commercial aspects of trapping. **Table 16** provides a summary of potential environmental effects that may occur during Project construction and operations and maintenance, and proposed mitigation measures that will be used to reduce the potential for impacts on hunting, trapping, fishing and gathering. **Chapter 10** of the EIS presents additional detail regarding anticipated effects and specific mitigation measures that will be implemented over the course of the Project.

Table 16: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Hunting, Trapping, Fishing and Gathering

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Reduced licensed hunting success due to temporary disturbance to wildlife from construction activities. ▪ Reduced commercial and traditional use trapping success due to temporary disturbance to wildlife from construction activities (aquatic and terrestrial furbearers). ▪ Reduced land access to hunting, trapping, fishing and gathering resource use areas during construction. ▪ Reduced access to major waterways associated with fishing activities during construction. ▪ Reduced traditional fish harvest success in major waterways during construction. ▪ Loss or impairment of areas for berry picking and cultural/medicinal plant gatherings due to construction activities. ▪ Reduced traditional use hunting success due to increased non-resident hunting pressure as a result of road access 	<ul style="list-style-type: none"> ▪ Engage communities in the planning and design of the all-season road and incorporate feedback. ▪ Communicate information on planned and active construction activities to facilitate local planning of harvesting activities and provide opportunities for ongoing input into the Project. ▪ Avoid preferred harvest areas identified by communities. ▪ Routing all-season road to avoid areas of high quality habitat where feasible. ▪ Temporary construction-related access roads will be blocked following construction; natural re-vegetation will be encouraged and augmented by native plants and seeds. ▪ Measures to protect and avoid disturbance to wildlife minimizes disruption to traditional hunting activities. ▪ Maintain vegetative buffer zones between the all-season road and lakes or ponds along the right-of-way. ▪ Limiting construction to work areas. ▪ Measures to protect wildlife will minimize adverse effects to hunting success. ▪ Measures to protect fish and fish habitat will minimize adverse effects to recreational fishing success. ▪ Navigation access to be retained during construction. ▪ Watercourse crossings to be designed for boat passage or to include portages. ▪ Installation of trapline signage. ▪ Decommission temporary access roads, block access to temporary activity areas and encourage re-growth to deter non-local hunters from using the road as an access point.

Traditional knowledge studies, trapper engagement and community engagement sessions were used to gather information and consider input from the community members to minimize potential Project-

related effects on hunting, trapping, fishing and gathering. Following the application of mitigation measures, the predicted residual effects of the Project for hunting, trapping, fishing and gathering are:

- Temporary impairment of traditional resource use (hunting) or licenced hunting;
- Temporary impairment of traditional resource use (trapping);
- Temporary limited access or detoured access to land trails used to access hunting, trapping fishing and gathering resources use areas;
- Temporary impairment of traditional resource use (fishing) during construction of key waterway crossings; and
- Minor loss / impairment of traditional use areas for gathering. Road will open new areas for access.

Following the application of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant residual adverse effects on hunting, trapping, fishing and gathering are anticipated to occur as a result of the Project. To determine if predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be performed as necessary.

5.2.17 Travel Routes

Travel routes are important to all communities of the Regional Assessment Area in providing seasonal access to allow traditional activities of cultural importance including hunting, trapping, fishing and gathering. Travel routes of the Regional and Local Assessment Areas include walking, ATV, and snowmobile trails as well as openwater and frozen waterways. Outside of communities, abandoned, informal and disconnected road segments are found that historically were associated with logging or other activities. The formal network of winter roads operated by the Province provides important travel routes although these roads are not usually associated with traditional activities. Information regarding the watercourse travel routes bisected by the Project was obtained from local communities during the Aboriginal and Public Engagement Program.

During Project construction and operations and maintenance, the proposed all-season road may bisect some traditional travel routes resulting in the impairment of access to, or travel on, travel routes. Disruption to travel routes that intersect the proposed Project road right-of-way will be temporarily blocked during construction as each segment of the all-season road is completed. **Table 17** provides a summary of potential environmental effects that may occur over the course of the Project and proposed mitigation measures that will be used to reduce the potential for impacts travel routes. **Chapter 10** details the anticipated effects to travel routes as a result of construction and operations and maintenance as well as specific mitigation measures that will be implemented during these phases of the Project.

Table 17: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Travel Routes

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Reduced access to, or travel on, travel routes including land trails and waterway routes bisected by the Project. ▪ Substantial additional travel route (P4 all-season road) that is connected to the southern Manitoba network, and access to potential new travel routes. 	<ul style="list-style-type: none"> ▪ Design watercourse crossings at major rivers to accommodate navigability. ▪ Provide access ramps to traditional travel routes bisected by the all-season road. ▪ Create temporary detours for snowmobiles and ATVs during construction. ▪ Identify and sign detour routes and portages. ▪ Construction contract provision requiring key travel routes be maintained. ▪ Provide community updates regarding location and timing of construction activities.

Following the application of mitigation measures, the residual Project-related effects remaining for travel routes are:

- Temporary reduction in access travel routes including land trails and waterway routes; and
- Substantial additional travel route, and access to potential new travel routes.

As reduction in access travel routes is a temporary and short-term effect expected to be limited to within the Local Assessment Area, no significant adverse residual effect is expected.

5.2.18 Cultural, Heritage and Archaeological Resources

Archaeological sites along rivers and lakeshores in the area suggest that First Nations have lived in the area for at least 2,500 years, and in some areas, over 3,000 years (Poplar River 2011). An archaeological investigation was undertaken in 1999 to document historic land uses along the Poplar River and at Weaver Lake due to the importance of these waterbodies. Fifteen archaeological sites were discovered including a site of major importance at Weaver Lake. Two previously discovered pictograph sites were revisited. To supplement the known body of cultural, heritage and archaeological resource information, Traditional Knowledge was shared by local community members to further document traditional activities and the cultural heritage of Aboriginal Peoples in the Regional Assessment Area.

In support of the proposed P4 Project, Heritage Resources Impact Assessments (HRIAs) were completed to discover archaeological sites potentially affected or in conflict with the proposed road alignment and potential quarry sites. Heritage Resources Impact Assessments (HRIAs) for the Project provided information that was used to refine the proposed road alignment where appropriate to avoid sensitive sites of high and medium priority, and inform mitigation measures.

Potential effects to cultural, heritage, and archaeological resources are anticipated to be primarily related to Project construction activities and include the loss and damage of known and unknown

heritage sites and objects, looting, and damage to known and unknown sites and objects, and the destruction and damage of abandoned and unmarked graves, or desecration of human remains. **Table 18** provides a summary of potential environmental effects on cultural, heritage, and archaeological resources that may occur Project construction and proposed mitigation measures that will be used to reduce potential impacts. Details of the anticipated effects to cultural, heritage and archaeological resources as a result of construction as well as specific mitigation measures that will be implemented over the course of the Project are presented in **Chapter 10** of the EIS.

Operations and maintenance of the proposed all-season road is not anticipated to affect cultural, heritage and archaeological resources in the Local Assessment Area considering vehicle use of the all-season road and maintenance activities will be confined to previously affected areas (i.e., during construction). Following the use of proposed environmental protection specifications and implementation of site-specific mitigation measures, no significant adverse residual effects on cultural, heritage and archaeological resources are anticipated to occur as a result of Project development.

Table 18: Summary of Potential Environmental Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Cultural Heritage and Archaeological Resources

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Loss or damage of known cultural, heritage and archaeological sites and objects in the Local Assessment Area during construction activities. 	<ul style="list-style-type: none"> ▪ HRIAs conducted to identify archaeological and heritage sites. ▪ Alignment of the all-season road refined to avoid known cultural, heritage and archaeological sites and objects. ▪ Flag construction exclusion areas around discovered/previously unknown cultural, heritage and archaeological sites. ▪ Relocate heritage resources that would be destroyed by construction activities (only with consent from Manitoba Heritage Resources Branch and the local community). ▪ Consult with the local community and/or the Metis on culturally appropriate measures if archaeological sites or objects are exposed during construction. ▪ Provide instructions to contractors on procedures if archaeological sites or objects are exposed during construction. ▪ Blocking and re-vegetating temporary access routes and other disturbed areas immediately after construction.

5.2.19 Human Health and Safety

The Project has the potential to directly affect the health and safety of both community members and workers during the construction and operations and maintenance phases. As no construction activity will take place within the boundaries of either Berens River First Nation/NAC or Poplar River First Nation, community members will be primarily subject to potential direct effects of Project construction and operations and maintenance activities when travelling outside of their communities. Effects on the health and safety of construction and maintenance workers are associated with effects of activities such as right-of-way clearing, blasting, road and bridge construction and maintenance and the operation of

heavy equipment and machinery in remote areas removed from medical facilities and services. Potential indirect effects of the Project on health and safety of community members are also considered and include potential effects of Project construction and operations and maintenance activities that alter existing drinking water quality, air quality, or noise exposure levels (**Chapter 7**, Physical Environment) and the quality and availability of country foods collected through hunting, trapping, fishing and gathering (**Section 10.2.4.2**). Information about the communities of Berens River First Nation/NAC and Poplar River First Nation is presented in **Section 10.1.4**. Information about construction activities, facilities and workforce is presented in **Chapter 3** (Project Description).

Table 19 provides a summary of potential environmental effects of the Project on human health and safety that may occur over the course of the Project and proposed mitigation measures that will be used to avoid or minimize potential impacts. Details of the anticipated effects to human health and safety as a result of construction and operations and maintenance, as well as specific mitigation measures that will be implemented over the course of the Project development are presented in **Chapter 7**, **Chapter 10** and **Chapter 12** of the EIS.

The potential environmental effects on human health and safety associated with Project construction and operations and maintenance activities are also linked to the potential direct and indirect effects on the environmental components that those activities interact with. Therefore, potential adverse effects of Project construction on human health and safety are, in part, determined through the assessment of Project construction effects on the VCs linked to those activities. For human health, associated environmental effects assessment determinations for other VCs are found in the effects assessment sections for Surface Water, Air Quality, Noise and Vibration and Hunting, Trapping, Fishing and Gathering (**Sections 7.2.4.1, 7.2.4.2, 7.2.4.3 and 10.2.4.2**, respectively). Mitigation measures that would be applied to avoid/minimize potential adverse effects of Project construction on VCs linked to human health and safety are also provided in the EIS sections referenced.

Table 19: Summary of Potential Effects and Proposed Mitigation Measures during Construction and Operations and Maintenance Phases for Human Health and Safety

Potential Environmental Effects	Mitigation Measures
<ul style="list-style-type: none"> ▪ Reduced health and safety of community members and construction workers due to interacting with, or participating in, Project construction activities. ▪ Reduced health of community members and construction workers due to changes in drinking water changes in air quality; changes in noise exposure; and changes in the availability or quality of country 	<ul style="list-style-type: none"> ▪ “Post “no entry”, warning signs and barricades (e.g., gates, fences), where necessary, around active construction sites; warning signs and reduced speed limits to be established at known wildlife crossing locations; warning signs and lights to be displayed for road maintenance equipment and trail crossings. ▪ Provide for safe access for trappers and other traditional users. ▪ Monitor and enforce restricted access conditions. ▪ Provide community updates regarding location and timing of construction activities. ▪ Workers to be educated regarding safe construction practices including use of Personal Protective Equipment. ▪ Develop and implement Site Health and Safety Plans prior to construction.

<p>foods.</p> <ul style="list-style-type: none"> ▪ Increased risk to health and safety of all-season road users and trail users from accidents and collisions due to road, ditch, culvert and bridge maintenance activities and snow clearing activities. ▪ Increased risk to health of community members due to: changes in drinking water quality; changes in air quality; changes in noise exposure; and changes in the availability or quality of country foods. 	<ul style="list-style-type: none"> ▪ Conduct regular construction site safety meetings. ▪ Conduct regular safety inspections of construction sites. ▪ Used trained and certified blasting crews. ▪ Equip and maintain construction equipment, machinery and vehicles with appropriate safety features (e.g., back-up warning devices). ▪ Speed limits on road to be established based on road design. ▪ Ramps for snowmobiles/ATVs to be placed at road/trail crossing intersections. ▪ Management of right-of-way vegetation to maintain driver sightlines and safety clearance. ▪ Approved dust suppressants (e.g., water) to be used as necessary ▪ As required, flag persons will direct traffic around maintenance activities. ▪ Community updates to be provided regarding the locations of scheduled maintenance activities. ▪ In-stream work will be conducted during winter months or low flow conditions and in isolation of flowing water to avoid/minimize downstream sediment transfer. ▪ Explosives will be detonated at sufficient setback distances to control for dust/debris expulsion. ▪ Where possible, undisturbed forested buffers will be retained around quarries to reduce noise from quarry operations. ▪ Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods to the extent feasible. ▪ Reclaim and rehabilitate areas disturbed by construction to encourage natural regeneration/regrowth of vegetation and habitat restoration.
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Following the application of mitigation measures, the residual Project-related effects remaining for human health and safety are:

- Risk to the health and safety of construction workers and community members from road and bridge construction
- Risk to the health of community members and construction workers from changes to drinking water quality, air quality and noise exposure levels from construction activities.
- Risk to the health of community members from changes to the availability or quality of country foods.
- Risk to health and safety of road and trail users.
- Improvement to the health and safety of road and trail users due to winter road decommissioning.

Following the application of proposed mitigation measures, no significant adverse residual effects on human health and safety are anticipated to occur as a result of the Project. Currently, the majority of travel between Berens River First Nation and Poplar River First Nation and other communities is by winter road during winter and by air during other seasons. Some travel also occurs by boat during the open water season. Once complete, the proposed P4 all-season road is expected to improve the safety

of travel to and from these communities resulting in an important Project benefit of improved health and safety for community members of Berens River and Poplar River.

5.3 Effects of the Environment on the Project

The determination of potential effects of the environment on the proposed Project is based on the ability of the constructed Project to withstand normal and potential extreme environmental events. Normal and potential extreme environmental events that have the highest risk of occurring within the Project area include, but are not limited to: extreme weather conditions; flooding; and forest fires. Potential effects of the environment on the Project in consideration of:

- The risk of extreme environmental events occurring;
- Mitigation inherent in the road design and related components (e.g., bridges) to withstand normal environmental conditions and atypical natural hazard events; and
- Environmental protection plans and emergency response procedures for the Project.

During construction, severe weather events could adversely affect the Project resulting in cost overruns, Project completion delays and adverse effects to the environment in the Local Assessment Area (e.g., erosion of road bed and downstream sedimentation). During operations and maintenance, severe weather events could force closure of the road for extended periods of time due to heavy snow accumulations during winter and stream washouts during the high-risk spring and summer seasons. Severe weather events can also lead to vehicle accidents which may result in fuel and other hazardous liquid releases and temporary road closures. There is some potential for the proposed Project to be affected by flooding due to seasonal flood events resulting from the rapid melting of high snow volumes and/or heavy rain events. Although severe weather events may result in localized erosion and sedimentation, landslides are not anticipated due to the relatively flat topography. The Project design has incorporated standard design measures (e.g., design standard of 1:100 year flood event for stream crossings; use of large diameter culverts) that are expected to mitigate potential effects of typical and predictable weather events and severe/extreme weather events such as flooding that may occur in the Local Assessment Area.

The risk of ground subsidence in the Local Assessment Area may result from: washout (erosion) events; changes to soil moisture content due to removal of vegetation; and variations in seasonal and annual precipitation. Installation of stream crossing and equalization culverts will minimize the potential for erosion and scouring that can compromise the integrity of the road base and embankment and result in potential ground subsidence and road damage. An additional measure that will be implemented to mitigate the potential for subsidence includes use of appropriate geosynthetic material (geotextile), as needed. Geotextile will be used to separate the road structure from areas with unsuitable soils to protect road structure integrity and provide for road and culvert reinforcement by containing road fill material at fen and bog crossing locations in consideration of the latest effective techniques for road construction in boreal wetland areas

Approximately three quarters of the Local Assessment Area was burned by forest fires between 1920 and 1929. Since then, there has been little to no fire activity documented over the proposed Project Footprint or Local Assessment Area. Approximately 40% of the Project right-of-way occurs within low-lying fen and bog complexes or sparsely-forested areas and is therefore less susceptible to forest fires in those areas. However, there is a potential for more densely forested portions of the proposed road right-of-way to be subject to forest fire events over the operational phase of the Project. In the event of a forest fire in the vicinity of the Project, mitigation procedures outlined in the Emergency Response Plan will be implemented (2.5). This may include temporary closure of the all-season road, as required, to minimize the potential for vehicle collisions due to reduced visibility caused by smoke. Substantial damage to Project components as a result of forest fires is not anticipated considering most Project components are made from materials that are not easily affected by fire (e.g., rock/gravel road fill; steel and concrete bridge structures).

The Project is located within a low seismic hazard area and is not located within the permafrost zone. Therefore, potential effects of earthquakes and melting of permafrost (e.g., due to climate change) on the Project are not anticipated.

In summary, the proposed Project can be viewed as a mitigation response to the effects of climate change impacts on the transportation needs of the local Berens River and Poplar River communities. The Project will provide all-season road access to these communities rather than the communities having to rely on temporary and less predictable winter road access and costly air transportation. The all-season road design standards incorporate mitigation into the Project design to avoid or minimize adverse effects of normal environmental conditions of the area. Taking into consideration the likelihood and risk of weather events and the implementation of mitigation measures and follow-up actions, no residual adverse effects of the environment on the Project are anticipated. Additional details regarding mitigation measures to avoid or minimize potential adverse effects of the environment on the Project are provided in **Chapter 11** of the EIA.

5.4 Accidents and Malfunctions

During Project construction, operations and maintenance activities there is a risk that accidents and malfunctions may occur that could potentially affect the biophysical environment and public safety. Such events may include: accidental spills and releases of hazardous materials on land and water; accidents or collisions involving construction equipment, machinery, vehicles and wildlife; and fires and explosions. The most likely potential accidents and malfunctions that have been identified based on the Project components, activities, equipment, and materials (type and quantity) associated with each Project phase include:

- Accidental release of hazardous substances;
- Fire or explosion; and
- Vehicle collisions.

With the application of ESRA's Environmental Protection Specifications and other environmental protection procedures, including best management practices and application of the contractor's Emergency Response Plan, the probability of accidents and malfunctions occurring and, risk to the environment should they occur, is low. Additional details regarding the preventative/contingency mitigation measures that will be implemented to avoid or minimize adverse effects of accidents and malfunctions are provided in **Chapter 12** of the EIS.

5.5 Cumulative Effects

A cumulative effects assessment was completed using predicted changes to VCs due to the proposed all-season road Project combined with other past, present and reasonably foreseeable future physical activities in accordance with the most recent CEA Agency guidance on scoping and assessment methods for cumulative effects. Scoping of the cumulative effects assessment included:

- Identifying VCs for which adverse residual environmental effects from the Project are expected;
- Determining the spatial and temporal boundaries to capture potential cumulative environmental effects on VCs that may experience residual effects; and
- Identifying the past, present, and future physical activities that are anticipated to contribute to the residual environmental effects of the Project on VCs.

Key factors that influenced whether a VC was carried forward to the cumulative effects assessment included:

- If the VC had the potential to be adversely affected by residual effects of the Project;
- If the VC was likely to be adversely affected by other past, present, or future physical activities within the defined spatial and temporal boundaries; and
- Consideration of feedback from the APEP.

Following the scoping process, the VCs carried forward in the cumulative effects assessment process were: air quality (GHG accumulations); moose; and boreal woodland caribou. The rationale supporting whether a VC was or was not carried forward is presented in **Chapter 13** of the EIS. For the VCs included in the cumulative effects analysis, a cumulative effect would be considered significant following application of mitigation measures if the overall magnitude of the cumulative adverse effect was considered to be high within, or potentially beyond, the cumulative effects assessment temporal and spatial boundaries.

Due to the remote nature of the cumulative effects assessment area, the past and present physical activities considered to potentially affect VCs were limited to:

- Current construction of ESRA's P1 all-season road project between PR 304 and Berens River First Nation;
- Existing infrastructure on and immediately adjacent to First Nation communities;
- Existing winter road use and maintenance;
- Past forestry roads;

- Manitoba Hydro transmission lines; and
- Traditional land and resource use including hunting, fishing and trapping.

Future physical activities that are certain and reasonably foreseeable included in the cumulative effects assessment are:

- The planned all-season roads east of Lake Winnipeg as part of the Large Area Transportation Network initiative by ESRA;
- The future Poplar River First Nation community access road (433 m) linking the proposed Project with the community;
- The future relocation of the Poplar River community airport;
- The planned future decommissioning of the existing seasonal winter roads between east side of Lake Winnipeg First Nation communities by the planned all-season roads; and
- Continued traditional resource use activities, including fishing, hunting, and trapping.

Table 20 summarizes the cumulative environmental effects significance conclusions for air quality, moose and caribou after consideration of mitigation measures. Based on these conclusions, no significant adverse cumulative effects are anticipated.

Considering no significant adverse cumulative environmental effects are anticipated from past, present, and reasonably foreseeable future activities, it is not expected that additional follow-up studies will be required other than follow-up studies proposed for the P4 all-season road Project to verify the accuracy of the environmental assessment of this Project and to determine the effectiveness of mitigation measures incorporated into the design, construction, operations and maintenance of the Project. Each proposed successive east side of Lake Winnipeg all-season road project will have commitments to mitigation measures and follow-up studies, which will be revised and adapted as required. In effect, pre-construction and follow-up studies associated with each proposed all-season road project, such as moose and caribou movement monitoring, will monitor the cumulative effects of the series of east side of Lake Winnipeg roads. Should unexpected adverse cumulative effects be identified in the future for the VCs assessed for cumulative effects, ESRA will discuss with MCWS the potential for the implementation of additional management mitigation measures that may be required.

Table 20: Cumulative Environmental Effects Significance Conclusions for Air Quality, Moose and Caribou

VC	Analysis	Magnitude of Adverse Cumulative Effect	Cumulative Effect Significance Conclusion
Air Quality (GHGs)	Although a temporary overall cumulative increase in greenhouse gas emissions would occur during the construction phase of the planned all-season roads, greenhouse gas emissions produced by vehicles using the all-season roads during the operations and maintenance phase are expected to offset emissions from the continued use of other modes of travel (e.g., air travel) if the all-season roads were not constructed. The result is expected to be an overall decrease in greenhouse gas emissions within the cumulative effects assessment area during the all-season road operational years resulting in no significant influence to global atmospheric greenhouse gases and no significant influence on climate change.	Low	Not Significant
Moose	Overall moose habitat loss and fragmentation due to past, present and future physical activities would be negligible in relation to the abundance of undisturbed moose habitat within the cumulative effects assessment area. From the perspective of moose habitat loss, the cumulative effect of the Project would be of low magnitude and low extent and therefore not be considered to be significant. In terms of adverse cumulative effects to moose populations within the cumulative effects assessment area, with the application of government conservation initiatives and on-going monitoring and enforcement of hunting limits by Manitoba Conservation and Water Stewardship, a decline in the moose population is not anticipated.	Low	Not Significant
Boreal Woodland Caribou	Overall caribou habitat loss and fragmentation due to past, present and future physical activities would be negligible in relation to the abundance of undisturbed habitat within the cumulative effects assessment area. Therefore, the cumulative effect of the Project in terms of the potential caribou habitat loss would not be considered to be significant based on the low magnitude and low extent of the cumulative habitat losses. With the application of government conservation initiatives and on-going monitoring and enforcement of Species at Risk protection by Manitoba Conservation and Water Stewardship, significant decline in the caribou population within the cumulative effects assessment area, specifically the Atikaki-Berens caribou management unit, is not anticipated.	Low	Not Significant

6.0 MONITORING AND FOLLOW-UP

ESRA will be implementing a program to monitor the proper application of measures and controls to minimize the potential for adverse environmental effects during all phases of Project development. The Monitoring Program is intended to assess whether the:

- The Project is being implemented as proposed;
- Measures implemented to mitigate the adverse effects of the Project (e.g., fish habitat off-setting, if required) are effective and the assessment of Project effects is accurate; and
- The Project is proceeding in accordance with required conditions as stipulated in regulatory permits, authorizations and ESRA guidance documents.

Regular inspections of Project design, construction, operations and maintenance components and activities will be documented and improvements will be implemented using appropriate and effective adaptive management techniques as needed. The program will also monitor the application of action plans and emergency response procedures for environmental protection and human health and safety.

In the event of the observation of non-compliance with legal and/or environmental requirements or contractor obligations to environmental protection, ESRA will have intervention mechanisms in place in the form of a clearly-defined management structure for reporting, decision-making, correction of non-compliance, and monitoring of corrective actions. ESRA's Environmental Management Plan is the tool that will provide the means to confirm that environmental protection activities have occurred and are being implemented as required. Monitoring, reporting, and management decision-making are integral to the various levels and elements of ESRA's environmental protection planning which is designed after the 5-step model for an environmental management system produced by the International Organization for Standardization (ISO) Standard 14001.

6.1 Monitoring Programs

To demonstrate accuracy of the predicted Project effects and mitigation on VCs where uncertainty exists as stated in this EIS, post construction monitoring programs targeting VCs will be implemented where and when appropriate. Follow-up/post-construct monitoring studies will be developed in concert with appropriate regulatory bodies and will be based on the results of the pre-construction and construction monitoring programs, specific site situations, and licence/authorization/permit/approval requirements. General update information on the status of monitoring studies will be provided to local communities. ESRA is committed to on-going dialogue with location community members regarding the monitoring of species important to traditional use. It is anticipated that post-construction monitoring studies may be carried out on the following VCs Fish Habitat, Mapleleaf Mussel, Caribou, Moose, and Furbearers as summarized below. The monitoring programs for these VCs are described in **Sections 6.1.1 to 6.1.5**.

6.1.1 Fish Habitat

To determine if mitigation measures are performing as intended, post-construction monitoring may be performed at fish bearing crossing sites and off-setting sites where necessary. Parameters may include fish passage, sediment, and erosion control and/or off-setting projects. Methods may include conducting inspections, collecting photographic records, biological sampling, and physical measurements. Frequency and duration of monitoring will be determined in discussion with the Department of Fisheries and Oceans Canada, and Manitoba Conservation and Water Stewardship, and will be designed specifically to each site.

6.1.2 Mapleleaf Mussel

To determine the health of Mapleleaf mussels following relocation, post-construction monitoring may be required. Parameters may include species occurrence, survival, growth, and/or movement. Methods may include conducting ponar grabs, diving operations, mussel raking, and bathyscope identification. Frequency and duration of monitoring will be determined in discussion with the Fisheries and Oceans Canada, and Manitoba Conservation and Water Stewardship, and will be designed specifically to each site where Mapleleaf mussels have been relocated.

6.1.3 Caribou

To determine if the predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be conducted, as necessary. Parameters to be assessed as part of caribou follow-up monitoring studies may include distribution, calving, habitat, range fragmentation, and/or pregnancy analysis. Methods may include conducting aerial surveys, caribou collaring, obtaining GPS tracking data, point density analysis, blood and fecal sample analysis, and/or traditional knowledge acquired through Trapper Participation Programs. Frequency and duration of monitoring efforts will be determined in discussion with Manitoba Conservation and Water Stewardship. Construction monitoring results may indicate that no follow-up monitoring is required.

6.1.4 Moose

To determine if predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be carried out, as necessary. Parameters to be evaluated as part of moose follow-up monitoring studies may include distribution, moose/caribou range overlap, and/or predation by wolves or other animals. Methods may include conducting aerial surveys, wolf collaring, and/or traditional knowledge acquired through Trapper Participation Programs. Frequency and duration of monitoring efforts will be determined in discussion with Manitoba Conservation and Water Stewardship. Construction monitoring results may indicate that no follow-up monitoring is required.

6.1.5 Furbearers

To determine if predicted effects are occurring and if mitigation measures are performing as intended, post-construction monitoring may be performed as necessary. Parameters may include distribution

and/or abundance. Methods may include conducting aerial surveys, trail camera studies, and/or Trapper Participation Programs. Frequency and duration of monitoring efforts will be determined in discussion with Manitoba Conservation and Water Stewardship. Construction monitoring results may indicate that no follow-up monitoring is required.

The post-construction monitoring studies summarized above will be implemented where and when necessary and reviewed with regulatory authorities and finalized prior to the initiation of the proposed post-construction monitoring program. In the event that unexpected adverse effects to a VC(s) are observed during post-construction monitoring studies, adaptive management strategies to mitigate adverse effects will be determined in discussion with regulatory authorities, and appropriate mitigation will be implemented, as required.

6.2 Reporting

Reporting on follow-up studies will be submitted to ESRA annually by consultants conducting the studies. Post-construction monitoring reports and data will be made available to regulatory authorities as required. ESRA's Environmental Senior Officer and Contract Administrator will report results of the Monitoring Program to ESRA's Project Managers and the Manager of Special Projects and Environmental Services (Environmental Manager) who will take corrective action as necessary based on ongoing measurement of key characteristics of the construction and post-construction activities and implemented mitigation efforts. Results of the Monitoring Program will be reported to regulatory authorities, the communities and public as indicated in the permits, authorizations, approvals, or licence requirements for the Project, or as otherwise requested. The content, format, number, and frequency of Monitoring Program reports for regulatory authorities will be determined in accordance with guidance received from regulators.

7.0 SUMMARY AND CONCLUSIONS OF THE EIS

7.1 Summary

The East Side Road Authority (ESRA) is mandated to manage the East Side Transportation Initiative to provide improved, safe and more reliable transportation service for the remote and isolated communities on the east side of Lake Winnipeg. As part of the Large Area Transportation Network Study, ESRA must design and construct an all-season road on provincial Crown land to connect Berens River First Nation to Poplar River First Nation (the Project) and ensure that local communities participate in, and benefit from, the Project. Construction and operation of the proposed 94.1 km two-lane gravel all-season road requires federal and provincial regulatory approval.

The proposed all-season road Project is located on the east side of Lake Winnipeg in a remote and largely unsettled and undeveloped area of the Province. The flat, low-lying landscape is a poorly-drained patchwork of boreal forest, bogs/fens and bedrock outcrops. Mammal, bird, fish and herptile species, including some of conservation concern such as the boreal woodland caribou, inhabit the area. The communities of Berens River First Nation/Northern Affairs Community and Poplar River First Nation

are the only human settlements in the Local Assessment Area and are connected by winter road to the southern road network for a brief period each year. Transportation to and from these communities is otherwise primarily by aircraft. ESRA is currently constructing a new all-season road from the Provincial road network to Berens River. Land use in the Local Assessment Area is mainly traditional activities by local community members such as hunting, trapping, fishing, camping, timber harvest for firewood, recreation activities, sacred/ceremonial uses, and food and medicine gathering.

An Aboriginal and Public Engagement Program (APEP) was undertaken to provide meaningful opportunities to engage in dialogue and exchange information about the proposed Project and other proposed transportation initiatives on the east side of the Lake. Engagement activities were focused on interaction with and feedback from potentially interested and affected communities and community members, as well as the general public. The engagement program comprised face-to-face meetings and discussions with First Nation and Metis leadership, community members, regulators, trappers, outfitters, and members of the general public.

An environmental impact assessment of the Project was completed using a values-based framework through the consideration of linkages between VCs of the environment and anticipated Project activities. Information provided through the engagement program, workshops, published literature, baseline studies, and professional perspective was relied upon for the impact assessment. Mitigation measures and procedures for their effective implementation were identified from regulatory and industry standards, environmental guidance documents and ESRA-developed environmental protection specifications to avoid, minimize or offset potential adverse environmental effects of the Project. The effects of accidents and malfunctions and potential effects of the environment on the Project were also assessed, as were sustainability, climate change, and cumulative effects. Follow-up actions, such as construction- and post-construction monitoring programs, were identified where required by legislation and/or guidance documents, and to address uncertainty arising in the identification of environmental effects or the ability to mitigate those effects. Residual environmental effects were evaluated based on a significance evaluation framework developed by ESRA.

Potential environmental effects of the Project that may influence human health and safety are assessed in **Section 5.2.19** and indicate that no significant adverse direct or indirect effects of construction and operations activities or changes in air quality, noise and water quality or the availability or quality of country foods are anticipated. Therefore, no significant adverse effects to human health and safety are expected that are linked to changes to the environment as a result of the Project.

ESRA is committed to implementing a broad suite of mitigation measures and follow-up actions identified by the environmental impact assessment through ESRA's comprehensive Environmental Protection Program. As the Project proponent, ESRA will be responsible for implementing, inspecting and reporting on this program through the construction and operations and maintenance phases.

7.2 Conclusion

Based on the information and analysis provided in this Environmental Impact Statement, it is concluded that the proposed all-season road connecting Berens River and Poplar River First Nations is not likely to cause significant adverse environmental effects. The Environmental Impact Statement also concludes that Project benefits (i.e., positive effects such as training, employment and business opportunities) can be expected.