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## 2.0 PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED

### 2.1 Project Need and Purpose

#### 2.1.1 Project Need

The P4 Project will provide all-season road access between the communities of Berens River First Nation, Berens River Northern Affairs Community (NAC) and Poplar River First Nation. Currently, there is no all-season road access between the Berens River First Nation and Poplar River First Nation communities. The nearest all-season road is approximately 66 km south of Berens River First Nation, connecting Bloodvein First Nation to the Provincial highway network at Provincial Road (PR) 304 near Hollow Water First Nation. The existing transportation infrastructure in the vicinity of the Project consists of:

- Seasonal winter roads from Bloodvein First Nation to the Berens River and Poplar River communities which is operational for approximately 2 months per year;
- A 2,500 foot (260 m) gravel runway and airport building serving Poplar River First Nation;
- A 2,900 foot (885 m) gravel runway and airport building serving the Berens River First Nation and the Berens River NAC; and
- Lake Winnipeg landings servicing private operator barge traffic for Berens River and Poplar River communities.

Existing transportation infrastructure constrains movement of goods, services and people. While the existing seasonal winter road and private barges are utilized to transport equipment, fuel and other bulk supplies, perishables, and other consumable items are shipped to the area primarily by air. Travel by individuals is similarly constrained, with private vehicles being used while the winter road is operational to access services and purchase household items in larger centres. Travel by air is available for the remainder of the year. Private vessels are seldom used for transportation due to distances and the dangerous conditions on Lake Winnipeg.

As a result of the nature of transportation options, goods and services in Berens River and Polar River are expensive. For example, the price of fuel is approximately 1.5 to 2 times higher and the price of perishable items such as milk and fresh produce up to 7 times higher than in centres serviced by all-season roads. The high cost of air travel from the communities (~\$430 round trip Winnipeg to Berens River and ~\$650 round trip Winnipeg to Poplar River [Northway Aviation 2015]) further limits personal transportation. The bulk of transportation occurs during the winter road season because of the lower transportation costs for individuals and goods.

## 2.1.2 Background

Since 1999, the Government of Manitoba has investigated the feasibility, justification and scoping of the development of an all-season road network on the east side of Lake Winnipeg. Key steps have included:

- A 1999 study led by Manitoba Transportation and Government Services (now Manitoba Infrastructure and Transportation) assessing the feasibility of an east side all-season road network (Dillon Consulting Limited 1999);
- A follow-up study assessing the justification and scope of two potential all-season road route scenarios (Dillon Consulting Limited and H.N. Westdal & Associates 2000);
- A 2001 assignment culminating in the development of a planning approach and overall work plan to design and service east side of Lake Winnipeg communities with an all-season road network (Dillon Consulting Limited and N.D. Lea 2001);
- The development of a Broad Area Plan entitled “*Promises to Keep... – Towards a Broad Area Plan for the East Side of Lake Winnipeg*” (East Side Planning Initiative 2004) presenting a number of transportation-related recommendations including engagement of directly affected First Nations and other communities, the assessment of environmental effects of transportation alternatives, and the completion of a Regional Transportation Network Study to consider other means of access (e.g., rail, ferries) to communities on the east side of Lake Winnipeg; and
- Multi-disciplinary planning and engineering for the 2008 Large Area Transportation Network Study to identify a preferred all-season transportation network connecting east side communities with Manitoba’s existing all-season road network, as well as to assess the feasibility of alternative surface and air transportation modes. The final report of the Study, completed in 2010, recommended an all-season road network for the region that is estimated at approximately 1,028 km in length at a cost of approximately \$3 billion (2011\$) (SNC-Lavalin *et al.* 2010a;b;c;d).

The outcome of more than a decade of comprehensive consideration was that the construction of an all-season road network, supplemented during its development with, where appropriate, improved winter roads and permanent bridges, was the most feasible, reliable, safe, and equitable transportation improvement on the east side of Lake Winnipeg. To support this outcome, the Government of Manitoba introduced the East Side Transportation Initiative to connect the remote communities on the east side of Lake Winnipeg with the rest of Manitoba and established the Manitoba Floodway and East Side Road Authority (MFESRA) as the provincial Crown Agency to manage the initiative through the planning, design and construction of all-season roads.

The first segment of all-season road being developed within the east side of Lake Winnipeg regional transportation network connects PR 304 (near Hollow Water First Nation) to Bloodvein First Nation, Berens River First Nation and Berens River NAC. The Project is referred to by ESRA as Project 1 or “P1”. An environmental assessment for the Project, completed under *The Environment Act* (Manitoba), was approved by Manitoba Conservation in August 2010 and a licence issued. In July 2011, following a Comprehensive Study conducted under the *Canadian Environmental Assessment Act*, the federal Minister of the Environment concluded that there were no likely significant adverse effects from the P1

project and that the identified mitigation measures and follow-up program were appropriate for the project. The P1 all-season road is currently under construction. The proposed P4 Project will connect with the P1 all-season road to extend all-season road access north from Berens River First Nation and Berens River Northern Affairs Community to the Poplar River First Nation.

### 2.1.3 Purpose of the Project

The purpose of the proposed 94.1 km P4 All-Season Road Project is to connect Poplar River and Berens River First Nations to the all-season road currently under construction between PR 304 and Berens River First Nation and by doing so, the Project will provide year-round vehicular access to Manitoba's southern road network. The Project is one of a series of all-season roads planned for a regional transportation network on the east side of Lake Winnipeg. The regional transportation network will allow all-season road access for First Nation communities that currently 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.

## 2.2 Project Alternatives

### 2.2.1 Alternative Transportation Options

As described previously, at the outset 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.

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. **Table 2.1** summarizes the alternative modes considered along with some of their key evaluation considerations.

*Transportation modes other than an All-Season Road Transportation Network were not deemed appropriate due to cost, unreliability, environmental damage, safety impairment, or lack of freedom to move.*

With regard to the alternative modes of transportation and evaluation considerations listed in **Table 2.1**, 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).

**Table 2.1: Alternative Surface and Air Transportation Modes**

Transportation Mode	Evaluation Considerations
Railway	<ul style="list-style-type: none"> <li>▪ Construction cost on a per km basis comparable to that of an all-season road;</li> <li>▪ 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;</li> <li>▪ Flatter gradients required for rail versus road increases cost and may also be more difficult to maintain rideable profile over fen and bog complexes;</li> <li>▪ During construction phase, difficult to offload/reload goods and people at continually advancing rail/winter road interface; and</li> <li>▪ Less freedom to move than with a road system.</li> </ul>
Hovercraft	<ul style="list-style-type: none"> <li>▪ Suitable over large bodies of open water;</li> <li>▪ Would likely suffer skirt degradation over fens and bogs;</li> <li>▪ Damage to the environment over potential multiple routes; and</li> <li>▪ May damage ice surface during freeze up, potentially breaking ice and creating hazards for snowmobilers.</li> </ul>
Airships/Dirigibles	<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ 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).</li> </ul>
Ferries	<ul style="list-style-type: none"> <li>▪ May be appropriate for summer transportation across lakes or rivers as an interim lower cost link in an all-season road system; and</li> <li>▪ 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.</li> </ul>
Improved Winter Roads	<ul style="list-style-type: none"> <li>▪ Shift existing winter road onto firmer ground along a future all-season road route;</li> <li>▪ Provide permanent bridges at major water crossings along future all-season road route; and</li> <li>▪ Could be initial phases in development of an all-season road route.</li> </ul>

Source: SNC-Lavalin *et al.* 2011a; Manitoba Transportation and Government Services 2005

In comparison with either the existing system or alternative means such as airships, 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.

In addition to considering other modes of transportation to improve year-round access to communities on the east side of Lake Winnipeg, the Large Area Transportation Network Study identified and assessed all-season road route options to connect east side communities to the existing Manitoba road network (SNC-Lavalin *et al.* 2011a). The following sections describe the Project route selection process and summarize the changes that have been made to the original Project alignment as a result of community input, including the benefits of these changes to the environment, Aboriginal peoples, and the public.

## 2.2.2 Road Route Alignment

### 2.2.2.1 Background

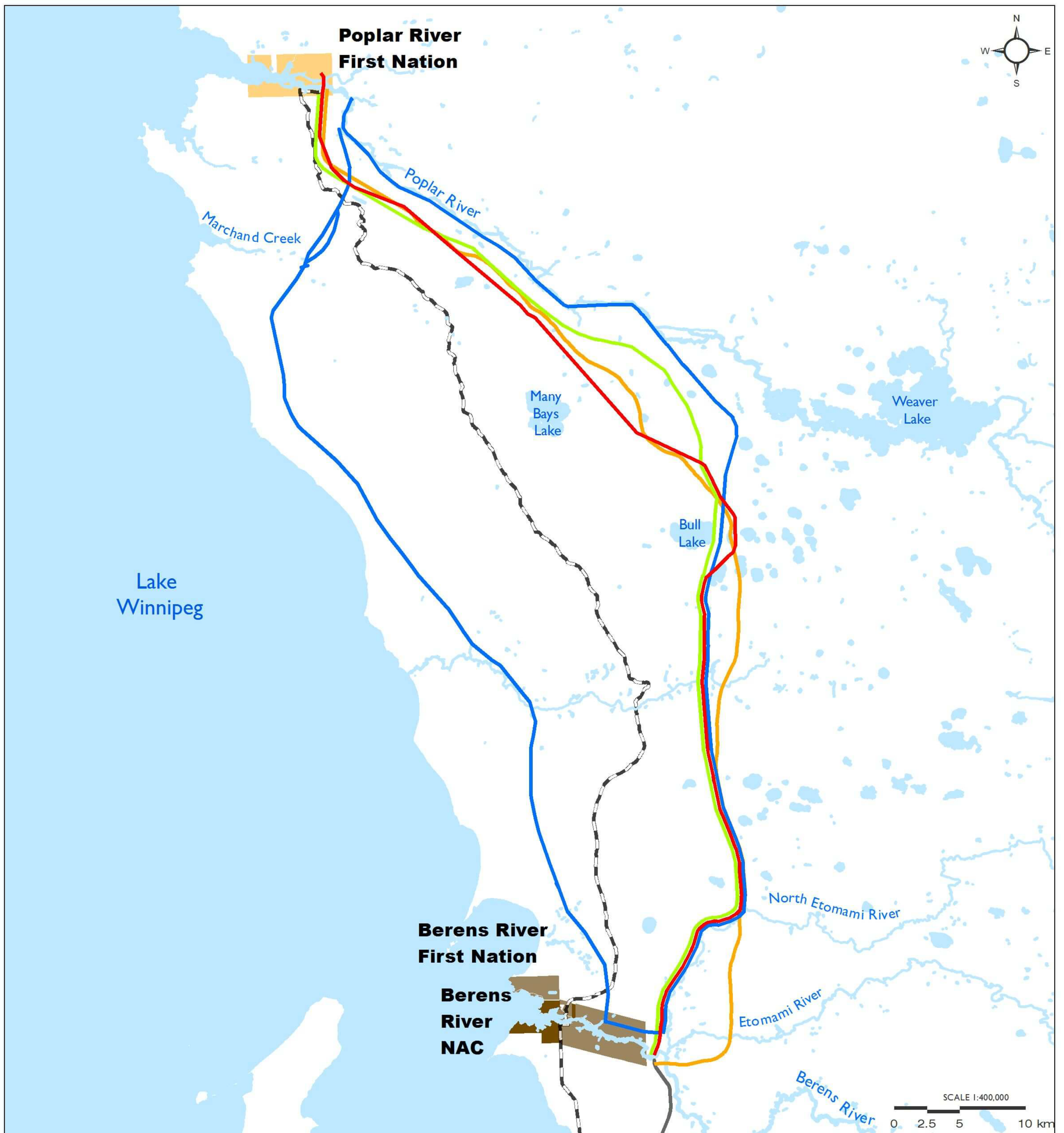
Within the 2008 East Side Large Area Transportation Network Study an all-season road corridor between Berens River First Nation and Poplar River First Nation was proposed at a preliminary level using aerial photo analysis and in consideration of terrain conditions, water crossings, available wildlife information (including Woodland Caribou Habitat Suitability Index Model results), Traditional Knowledge studies, feedback from community and public engagement, and designated land constraints (e.g., First Nation Reserves, protected areas). Consistent with the evaluation framework used for other east side all-season road route options (SNC-Lavalin *et al.* 2011b), the evaluation criteria for the P4 all-season road corridor between Berens River First Nation and Poplar River First Nation considered:

- Technical Aspects: Travel distance; terrain conditions; borrow/road construction materials availability; construction constraints/limitations;
- Natural Environment: Potential effects on species at risk; potential effects on environmentally sensitive features; habitat fragmentation; potential effects on aquatic habitat;
- Social/Cultural Environment: Potential effects (positive and negative) on traditional uses of land, culturally sensitive resources, community infrastructure benefits, community well-being and community knowledge and interest; and
- Capital and Maintenance Costs: Estimated capital cost of bridges, culverts and road; estimated annual maintenance costs.

*Road route selection criteria included consideration of technical aspects, natural environment, social/cultural environment, and capital and maintenance costs.*

The original winter road alignment for the proposed P4 Project alignment was not considered feasible early in the route planning process primarily due to feedback received from community engagement meetings identifying extensive areas of fens and bogs and flood-prone areas to the south and east of the Poplar River First Nation (SNC-Lavalin *et al.* 2011a). In 2009/2010 three different route options were considered; two route options located between the winter road route and the shore of Lake Winnipeg; and an inland route heading north from Berens River First Nation to the Poplar River, then following the river to Poplar River First Nation (**Figure 2-1**). The two shoreline route options were not considered





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

**Figure 2-1  
History of the P4 All-Season Road Alignment Alternatives**

- |  |  |   |
|--|--|---|
|  P4 All-Season Road Alignment (October 2015)  |  P1 All-Season Road (South of Berens to PTH 304) - Under Construction |  Poplar River First Nation Reserve |
|  P4 All-Season Road Alignment (February 2012) |  2013/2014 Manitoba Winter Road                                       |   |
|  P4 All-Season Road Alignment (March 2011)    |  Northern Affairs Community   |   |
|  P4 All-Season Road Alignment (2009/2010)     |  Berens River First Nation Reserve                                    |   |

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: 11/30/2015



feasible primarily due to the extensive areas of fens and bogs the alignments traversed and the lack of suitable rock materials for road construction in the vicinity as well as concerns regarding the potential for flooding (J.D Mollard and Associates Ltd. 2011).

In 2011, as a result of engineering studies and community feedback from the Project engagement program, a variation of the inland route located west of the Poplar River. This new alignment reduced the potential for disturbance of traditional use areas in proximity to Poplar River (**Figure 2-1**; J.D Mollard and Associates Ltd. 2011).

Since 2011, the proposed all-season road corridor between Berens River First Nation and Poplar River First Nation has been refined further through an iterative process using the above-stated evaluation criteria and additional community feedback. The history and rationale of the road alignment alternatives, culminating with the proposed P4 Project alignment, is summarized in **Table 2.2** and illustrated in **Figure 2-1**.

#### *2.2.2.2 Preferred Alignment*

The October 2015 P4 all-season road alignment illustrated in **Figure 2-1** is currently the preferred alignment and is the alignment proposed and assessed in the EIA component of this EIS. The alignment proposed reflects considerable involvement of local communities. The proposed P4 alignment avoids locations indicated as important traditional and heritage resource use areas. The proposed route is in close proximity to suitable road construction resources (potential quarry sites) which minimizes the length of access roads and resulting disturbance to the environment. The proposed alignment is also located on suitable terrain/ground conditions which will facilitate road construction logistics, minimize the quantity of materials needed to construct the road and minimize the duration of road construction, further minimizing environmental disturbance.

### **2.2.3 Watercourse Crossings**

#### *2.2.3.1 Bridges*

Four permanent steel girder bridges are required to provide safe access across the four rivers intersecting the proposed road alignment (see **Figure 1-7** in **Chapter 1**). At each river crossing, the bridge location was selected based on a series of factors including:

- Shore to shore distance;
- Approach conditions;
- Riparian characteristics;
- Watercourse substrates;
- Hydrology and channel hydraulics;
- Footprint area;
- Preservation of navigability;
- Bridge design standards and specifications;



**Table 2.2: Chronology of Alignment Revisions to the P4 All-Season Road Route Options (Refer to Figure 2-1)**

	Comments Provided by Communities	Revisions based on Community Input	Revisions based on Engineering and Environmental Considerations
<b>2009/2010</b>	<b>Three (3) route options considered: two (2) options between winter road and Lake Winnipeg shoreline; one inland route</b>		
	<ul style="list-style-type: none"> <li>Information provided regarding potential flooding of alignment options between winter road and Lake Winnipeg due to abundant bog and fen areas.</li> </ul>	<ul style="list-style-type: none"> <li>Inland route option preferred and selected over options closer to Lake Winnipeg due to local information about ground conditions and potential flooding.</li> </ul>	<ul style="list-style-type: none"> <li>Inland route option preferred over options closer to Lake Winnipeg primarily based on more suitable ground conditions and location of road construction materials (rock sources).</li> </ul>
<b>Resulting Benefits</b>	<ul style="list-style-type: none"> <li>Locating the road on the more suitable ground conditions of the inland route minimizes potential for degradation of structural integrity of the road, reduces potential for flooding and minimizes disturbance to fen and bog areas; and</li> <li>Locating the road closer to rock sources minimizes natural area disturbance to access and transport road-building materials (i.e., rock).</li> </ul>		
<b>2011</b>	<b>2009/2010 inland route realigned to the west of the Poplar River</b>		
	<ul style="list-style-type: none"> <li>Preference was expressed to move the inland route option away from Poplar River to protect traditional use areas associated with the river and adjacent areas.</li> </ul>	<ul style="list-style-type: none"> <li>Inland alignment option moved west and further away from Poplar River, as requested.</li> </ul>	<ul style="list-style-type: none"> <li>None indicated.</li> </ul>
<b>Resulting Benefits</b>	<ul style="list-style-type: none"> <li>Moving the inland route moved away from Poplar River mitigates potential adverse effects to traditional use areas/heritage resource areas associated with the river and adjacent area.</li> </ul>		
<b>2012</b>	<b>Route realignment further west from the Poplar River</b>		
	<ul style="list-style-type: none"> <li>Preference was expressed to move the route further away from Bull Lake due to traditional significance of the area; and further away from Poplar River to reduce disturbance to traditional use and heritage resource areas.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment moved further east of Bull Lake and further west from Poplar River, as requested.</li> </ul>	<ul style="list-style-type: none"> <li>None indicated.</li> </ul>
<b>Resulting Benefits</b>	<ul style="list-style-type: none"> <li>Adjusting the alignment, as requested, mitigates potential adverse effects to traditional areas around Bull Lake and further mitigates potential effects to traditional use areas / heritage resource areas in the Poplar River area</li> </ul>		
<b>2015</b>	<b>Route realigned to the east of Berens River, east of Bull Lake and northeast of Many Bays Lake</b>		
	<ul style="list-style-type: none"> <li>Request was made to move the Berens River crossing to the east to avoid traditional hunting areas.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment moved further east of Berens River, as requested (two additional river crossings added).</li> </ul>	<ul style="list-style-type: none"> <li>The alignment east of Bull Lake was further adjusted to provide for better surface constructability as well as better crossing of Leaf River; and</li> <li>Other adjustments made to locate alignment on better terrain for constructability and to reduce need for blasting of bedrock along the alignment.</li> </ul>
<b>Resulting Benefits</b>	<ul style="list-style-type: none"> <li>Further refinements to the preferred alignment mitigates potential adverse effects to traditional areas around Berens River; and</li> <li>Provides better terrain for road construction and minimizes potential adverse effects of blasting.</li> </ul>		

Source: SNC-Lavalin *et al.* 2010a,b,c,d; 2011a,b; J.D. Mollard and Associates Ltd. 2011; MFESRA 2012

- Traditional Knowledge; and
- Heritage resource assessments.

Proposed bridge locations were also subject to review by aquatic biologists retained to conduct aquatic baseline studies to assess potential impacts and mitigation required. In addition, input from First Nations community members regarding proposed bridge locations obtained at design workshops and community meetings was also taken into consideration in the selection of bridge crossing locations. As a result of this iterative process, refinements to the location of all four bridge crossings were made.

#### 2.2.3.2 Culverts

Culvert locations were identified based upon the proximity of the proposed P4 road alignment to area streams, characteristics of each particular stream, navigability considerations and riparian conditions. Culverts were required at a number of locations to provide safe access across fish-bearing and non-fish bearing streams and to equalize surface and shallow subsurface hydraulic conditions adjacent to the proposed road. 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. Proposed stream crossing locations were also subject to review by aquatic biologists retained to conduct aquatic baseline studies.

### 2.2.4 Other Components

#### 2.2.4.1 Quarry and Borrow Area Locations

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. Quarry and borrow areas will be located within the 100 m of the proposed road right-of-way where possible and will be subject to provincial permitting requirements. Potential quarry and borrow locations have been discussed with Poplar River and Berens River community members at design workshops and community meetings. 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.

#### 2.2.4.2 Temporary Camp and Staging Area Locations

Temporary construction camp and staging areas will be selected for the construction of the proposed road and crossings based on consideration of factors such as: travel distances for equipment and workers; availability of suitable level sites; extent of site preparation work required; and proximity to the road and crossings construction sites. Construction camp and staging locations will also be subject to Heritage Resources Impact Assessments and on-going input from First Nations community members



through workshops and/or community meetings. Construction camp and staging locations will be sited within the existing 100 m right-of-way to the extent feasible.

#### *2.2.4.3 Locations for Temporary Access*

The total length and need for temporary access routes are contingent on the locations of required construction camps, construction staging areas, and borrow and quarry areas. The alignment options of temporary access routes will consider the minimization of potential adverse effects to environmental and heritage resources components, soil, and terrain conditions and input from Poplar River and Berens River community members.