5 Description of and Rationale for Alternatives

This section of the ToR provides a description of how and why project alternatives were developed, and a comparative screening of the alternative corridors considered to arrive at the corridor within which alignment options (alternative methods for implementing the Undertaking) will be considered to select the preferred option for assessment in the EA study and for more detailed engineering investigations and design development.

5.1 Range of Alternatives Considered

The Ontario EA process requires that two types of project alternatives be considered: "alternatives to" the Undertaking (i.e., functionally different ways of addressing an identified problem or opportunity to arrive at the preferred planning solution) and "alternative methods" of carrying out the Undertaking (options for implementing the preferred planning solution).

5.1.1 Alternatives to the Undertaking

The range of "alternatives to" the Project (i.e., functionally different ways of approaching the opportunities identified by Webequie First Nation to improve the community's economic and social well-being) was limited by the primary objectives of the Project, as determined by Webequie First Nation:

- Establish an all-season corridor that will facilitate the movement of materials, supplies and people between the Webequie Airport and the mineral exploration and proposed mine development activities in the McFaulds Lake area of Northwestern Ontario (specifically, the camps, the drilling/exploration projects and, in the future, mining facilities);
- Provide enhanced employment and other economic development opportunities to Webequie community members, while also allowing them to continue to reside in or around their community's traditional territory, engage in traditional uses of that land, and preserve their language and culture; and,
- Provide experience/training opportunities for youth to help encourage pursuit of additional skills through post-secondary education.

For transportation projects, alternatives to the Undertaking typically include such options as new or improved roads; new or improved rail service, air service or public transit service; the introduction of alternative means of transportation for goods movement (e.g., airships and hoverbarges in this case); or managing travel demand to influence how and when trips are made, or to modify/reduce the need for travel by encouraging the use of alternatives to trip making (e.g., telecommuting, videoconferencing, providing more medical services locally, providing more electronic access to training opportunities). Options also include the null or "Do nothing" alternative.

For the purposes of this assessment, the following alternatives to the Undertaking have been examined:

1. Do nothing
2. Upgrade the existing trail system to seasonal winter road
3. Alternative modes of transportation (hoverbarge, airship, rail)
4. Manage travel demand
5. New all-season road

Method of Evaluation

The analysis of alternatives to the Undertaking was done on a screening level. A number of factors were considered in the comparative analysis:

- *Capital and Operating Costs*
  Project costs will play a significant role in determining the economic viability of the Project. This includes all costs to build and operate/maintain the alternative. Although specific costing was not conducted for this analysis, based on previous experience, comparative costs are understood.
  - Costs to construct any infrastructure (road, railway, loading/unloading facilities, etc.);
  - Costs to operate (vehicles);
  - Costs to maintain (repairs, snow clearing, etc.).

- *Impacts to the Natural Environment*
  Webequie First Nation intends to develop and implement the Project in the most environmentally responsible way possible. A key consideration is maintaining the community's ability (and that of neighbouring communities) to engage in traditional uses of the land and resource base, which means minimizing potential adverse impacts to natural heritage features. Impacts to the natural environment arising primarily from construction were estimated at a screening level based on previous experience and general knowledge of the alternatives being considered. At this level of screening, impacts were considered to fall into one of two categories:
  - Potential general impacts to the aquatic environment resulting from construction/ maintenance at waterbody crossings; and
  - Potential general impacts to the terrestrial environment, primarily as a result of vegetation clearing during construction.

- *Social and Economic Benefits*
  WFN is also intent on maximizing project social and economic benefits in relation to the purposes for pursing the Project, stated above. Although the community will realize social and economic benefits from a number of aspects of building and operating/maintaining any of the alternatives considered, for the purpose of the screening, benefits were generally considered to flow from employment. Generally, the more jobs and the more sustainable the jobs (e.g., year-round versus seasonal employment) the greater the benefits for the community.

- *Reliability/Proven Technology*
  This factor considered the extent to which an alternative, particularly a technology, has been commercially proven to be feasible. Technologies that are new to the market and have not been tested to be economic and reliable at a commercial scale would be a risky investment. Lack of reliability was generally considered to be a critical failure that outright eliminated an alternative from further consideration.

The evaluation was qualitative, in that specific scores and weights were not applied. In many cases, one or more of the criteria were of sufficient concern to eliminate the alternative from further consideration. Alternatives were mostly compared to the all-season road option as a benchmark. A summary of the analysis is provided in the following paragraphs.

5.1.1.1 Alternative 1: Do Nothing – Null Alternative

The null (or Do Nothing) alternative provides a benchmark against which other alternatives can be compared, from a variety of perspectives, including cost/value, environmental effects, social and economic benefits, etc. If the null alternative proves to be the preferred alternative, there would be no undertaking and environmental assessment approval would not be required. This would limit transportation options between Webequie First Nation and the McFaulds Lake area to only the existing seasonal ground connections provided by a series of informal winter trails, and air connection between the Webequie Airport and the air strip at Noront Resources' Eagle's Nest mine.

Although this alternative would result in the lowest capital and operating costs, and the lowest natural environmental effects of all alternatives considered (as there is no project), it does not address the stated primary purpose, which is to provide a cost-effective and sustainable means of delivering goods and services from the Webequie community/airport to support and participate in mineral exploration activities and proposed mine developments near McFaulds Lake and thereby provide economic and employment opportunities to the community. In this scenario, there would be an imputed loss of social and economic benefits to the Webequie First Nation. Reliability does not apply to the Do Nothing alternative, as there is no project.

Despite the advantages of low capital and operating costs and limited environmental impacts, because the Do Nothing alternative will not provide any social and economic benefits to the community, and does not meet the purpose of the undertaking, the alternative will not be included for further consideration, except for the purposes of assessing the overall advantages and disadvantages of proceeding with the preferred method of implementing the Project (refer to Section 8 - Approach to Assessment and Evaluation of Effects).

5.1.1.2 Alternative 2: Upgrade Existing Trail System to Seasonal Winter Road

The existing trail system between Webequie First Nation and the McFaulds Lake area is largely only passable for the entire distance during the coldest winter months[4]. During the other seasons of the year, the trail system is interrupted by intermittent waterbodies, watercourses and large-scale wetlands (muskeg). In addition, the existing trails are narrow and suitable only for snowmobile access. They would have to be upgraded to current provincial standards/specifications for winter roads to facilitate heavy vehicles, such as transport trucks. The seasonal lifespan of the winter road could be lengthened marginally by the addition of permanent bridge/culvert structures across the larger watercourses that tend to open up soonest in the spring.

Upgrading the existing trail system to a winter road would have the advantages of lower capital and maintenance costs and somewhat lower and less permanent environmental effects than an all-season road, but would not return the same social and economic benefits to Webequie community members, as there would not be the opportunity to provide goods and services to the camps and facilities in and around McFaulds Lake throughout the year. Other disadvantages of a winter road connection include:

[4] A Nishnawbe Aski Nation media release at the time of the opening of the Wa-Pik-Che-Wanoog Bridge on the North Caribou segment of the Northern Ontario Resource Trail all-season road stated that "with a changing environment, commercial traffic on winter roads has been open for as few as 28 days in recent years; a significant reduction from 77 days a decade ago."

- Operational period limitations (winter road would only be operational for 5 to 8 weeks a year, depending on weather) and uncertainties (climatic vagaries) resulting in lower levels of reliability and overall economic activity;
- The majority of watercourse crossings will be directly over ice and snow, resulting in environmental impacts;
- Slower travel speeds than an all-season road, resulting in higher delivery costs; and
- Restrictions on the range of vehicle types, including heavy transport trucks.

The winter road upgrade option would result in lower capital costs than an all-season road, and relatively similar operating costs. However, the winter road upgrade would result in higher environmental impacts due to repetitive disturbance year to year, and reliability would be low due to the seasonality of the haul window and the uncertainty of the length of the winter season. Because the purpose of the supply road is to facilitate the safe and reliable transportation of goods and services between the Webequie Airport and existing mining exploration and future mine operations activities in the McFaulds Lake area, the limitations/disadvantages of an all-season road are not considered significant enough to offset the benefits of an all-season road, as it would not provide the level of social and economic benefits that are desired.

For these reasons, this alternative will not be considered further in the EA process.

5.1.1.3 Alternative 3: Alternative Modes of Transportation

Three (3) alternate modes of transportation were evaluated – hoverbarge (hovercraft); heavy lift airship (dirigible); and a new rail corridor.

Hoverbarge

Hovercraft technology has had a considerable and successful history, primarily in military and first response applications. The technology is uniquely suited to accessing rugged terrain and delivering cargo and people to isolated locations, and models have been developed for cold weather application (refer to **Figure 5.1**).

Figure 5.1: 200t Cold Weather Heavy Lift Hoverbarge (2009)

Sources: Marinelink.com and Hover Freight Air Cushion Systems

There are many general advantages of hovercraft:

- They can be assembled in a modular format at site or can be flown assembled to site (depending on size and weight and the design characteristics of the runway);
- They operate on conventional diesel fuel; operating costs are much lower than conventional aircraft and lower than transport trucks;
- They can access all terrain types, allowing all-season operations, although it is unclear if the technology has been proven on the range of terrain found between the James Bay Lowlands and the upland areas around Webequie;
- The hovercraft landing system, with “suck down” capability, allows for multi-surface operation and load transfer on land, water, ice and snow, while roll-on-roll-off (Ro-Ro) cargo loading/unloading capability facilitates heavy load operations;
- No substantive infrastructure is required for Ro-Ro operations;
- No direct impact to the environment, as they exert a ground pressure of 2.0 KPa or 0.33 pounds per square foot (less than the human foot); and
- Some craft can be operated as either passenger or cargo payload, providing some flexibility in application.

However, there are concerns/disadvantages to hovercraft technology that reduce its attractiveness for use on this project:

- Higher payload vehicles or hoverbarges (most typically with a payload of up to 50 tonnes) are rare in the marketplace and largely untested in commercial applications;
- At 50 tonnes, the payload of a hoverbarge is similar to that of a conventional 18-wheel transport truck. A comparable fleet of hoverbarges has never been commercially attempted;
- A cleared road/runway is required that must be kept clear of vegetation, although the specification and cost to maintain a corridor for hoverbarge is likely slightly less in comparison to a winter road and far less than an all-season road; and
- There is currently no company that is commercially manufacturing heavy lift hoverbarges; those companies that have in the past are no longer in operation.

One of the biggest advantages of this technology is that it can extend the life of a winter road into the warmer months of the year without having to build the road to the higher specifications of an all-season road. Conventional transport trucks could be used to supplement the hoverbarges in the winter months (operating season of the winter road), and the hoverbarges could continue providing service the remainder of the year. Alternatively, the conventional transport truck fleet could be entirely replaced by the similar payload hoverbarges to avoid duplication and redundant operating costs. Either way, this option would likely achieve the desired level of social and economic benefits.

However, despite some advantages, overall, the lack of proven technology, particularly in terrain similar to the project area, unproven commercial-scale operations and the lack of manufacturers, makes this an uncertain and unreliable choice over more conventional modes of transportation. In addition, although direct impacts would be very low once in operation, and operating costs are expected to be lower than conventional transport trucks and aircraft, the technology requires a cleared road equivalent to a winter road, resulting in similar environmental effects to the winter road alternative. Because of the general unreliability and unproven nature of the technology at the desired scale, this alternative will not be considered further in the EA process.

Heavy Lift Airship (Dirigible)

The dirigible was used in the 1930s and 1940s as an alternate mode of transportation to conventional aircraft. These 'lighter than air' ships were typically filled with a combination of helium and hydrogen. The infamous Hindenburg disaster, which resulted in loss of human life when the hydrogen ignited, resulted in the demise of the airship. However, in recent years, with advanced aerospace technology, the airship has enjoyed a resurgence, with several companies taking prototypes to commercial production. Now filled primarily with helium, the risk of combustion has been eliminated. In addition, the technology has been advanced, making modern airships 'heavier than air', which means they can be loaded and unloaded at ground level, eliminating the need for specialized mooring and loading/unloading infrastructure (refer to **Figure 5.2**). In addition to reducing costs and increasing practicality, this has also extended the range of terrain that can be accessed by the airships.

Figure 5.2: Lockheed Martin LMH-1 Hybrid Heavy Lift Airship

Source: Gasworld.com and Lockheed Martin

Although prototype heavy lift airships are achieving over 1,000 tonnes of payload (making them equivalent to sea borne cargo ships), most airships that are at or close to commercial production are achieving between 50 and 200 tonnes of payload. Fifty (50) tonnes of payload is equivalent to a conventional transport truck.

Unfortunately, similar to the hoverbarge, the heavy lift airship remains largely unproven commercially. Although some manufacturers report that orders have been placed, there is, as yet, no commercially operational fleet anywhere in the world. This may change over the next several years as orders become operational airships.

There are a number of advantages to heavy lift airships over alternative modes of transportation:

- Airships are far more fuel-efficient than conventional aircraft, which must constantly burn jet fuel to stay aloft;
- Costs are 80-90% less than equivalent payload aircraft to purchase and operate; operating costs are similar to transport trucks and rail (point to point);

- ‘Heavier than air’ technology removes the need for mooring and loading/unloading infrastructure; and
- No formal access roads are required between loading/unloading points, resulting in very low to no negative environmental effects.

Although the advantages of airships are attractive, and the desired level of social and economic benefits could potentially be achieved, the small payload of models that are close to or in commercial production are small. In addition, the lack of a proven commercial track record also remains a concern. Because of the general unreliability and unproven nature of the technology at the desired scale, this alternative will not be considered further in the EA process.

New Rail Corridor

This ToR recognizes the results of transportation investigations conducted in relation to the feasibility of rail transport in the region, including the KWG analysis and the Cliffs Integrated Transportation System that optimized all-season road connection of the Black Thor mine assets and facilities with the provincial highway system and the CN Rail system at Highway 584 near Nakina, as summarized by the Northern Policy Institute in its “Roads, Rail and the Ring of Fire” commentary paper (refer to **Appendix A - Relevant Background Studies, Provincial Plans and Policies**). The all-season road option was preferred over a heavy rail system from a cost, constructability and First Nations community benefits perspective. Although the long term advantages of the rail (vs road) option were recognized, rail capital costs in the order of 50% higher than road costs made the rail option less feasible. Similar arguments can be applied to planning alternatives for the WSR Project. More importantly, it should also be noted that advantages accruing to the rail options studied previously were associated with the movement of mine product; the Webequie Supply Road will not be used for this purpose, and the cost of constructing and maintaining rail infrastructure is not warranted for the type and volume of traffic envisaged.

Source: Railpictures.net. Photo by Mike Robin

There is currently no rail service between Webequie and the McFaulds Lake area and, historically, private sector proposals for serving the area have focused on a north-south connection between the Ring of Fire area and the national (CN Rail) corridor at Nakina (Northern Policy Institute, 2015). Similar to the hoverbarge option, a new rail right-of-way would have to be cleared (and maintained) through a “greenfield” environment. Further, establishing the infrastructure for such service is not aligned with provincial development plans and policies for the area under consideration (including lack of a connection to any existing or proposed rail network); would not be cost-effective (primarily due to the capital cost of constructing the line over steep terrain and thick peat deposits); and is considered beyond the financial means of Webequie First Nation under current and prospective funding agreements.

A rail line would likely achieve the desired level of social and economic benefits. Environmental impacts would likely be similar to those caused by construction and operation of an all-season road. The technology is also proven and reliable. However, the capital costs of this option would be much higher than all other options with very little, if any, additional benefits over other options. For these reasons, a heavy rail connection will not be carried forward for further consideration in the EA process.

5.1.1.4 Alternative 4: Manage Transportation Demand

Travel demand management mechanisms, such as modifying or reducing the need for travel by encouraging the use of alternatives to trip making (e.g., telecommuting, videoconferencing, providing more digital access to training opportunities), are deemed to be an auxiliary benefit of any long-term plan for introducing a corridor within which enhanced communications technology (broadband) can be installed.

Therefore, under the right circumstances, this alternative could be implemented in combination with a road and within the same timeframe.

5.1.1.5 Alternative 5: New All-Season Road

For application to this project, an all-season road is a conventional road, similar to those within the provincial highway network, which can be designed to different specifications depending on the type and volume of traffic using it and the cargo to be hauled from point to point.

From a technical perspective, an all-season road between Webequie and the McFaulds Lake area would have a number of general disadvantages compared to an upgraded winter road and most other alternative modes of transportation:

- Significantly higher capital and operating costs;
- Requires major planning, engineering and environmental review; and
- More costly to rehabilitate at closure.

However, there are a number of advantages to an all-season road that offset the disadvantages of a seasonal winter road upgrade:

- Provides services year round, resulting in more reliable passenger travel and delivery of goods and services to the mining explorers and operators in the McFaulds Lake area;
- Higher design standards, resulting in higher traffic speeds, accommodation of a wider range of vehicle types (including heavier trucks), and lower delivery costs;
- Less significant environmental effects to permanent watercourse crossings due to less frequent disturbance;
- Higher level of safety for travellers; and
- Increased overall economic activity, resulting in greater social and economic benefits to the Webequie community and others that participate in road development and the delivery of goods and services.

The all-season road is a reliable mode of transportation that would achieve the desired level of social and economic benefits. Although the environmental impacts of an all-season road would be higher than some other alternative modes of transportation, most of these are considered too unreliable to consider further in the analysis. Also, although the capital costs of an all-season road would be higher than most options other than a rail line (much higher costs), the general reliability and the potential for achieving the desired levels of social and economic benefits make this a very attractive alternative.

5.1.1.6 Preferred Planning Alternative

As discussed in the preceding report sections, a number of different alternatives were assessed for meeting the project objectives. Having considered the balance of advantages and disadvantages of each

alternative, the preferred alternative is the construction of a new all-season road between Webequie and the McFaulds Lake area.

Heavy lift airships and hoverbarges are not considered to be proven technologies and costs are somewhat uncertain, although likely comparable to transport truck haul costs. Current models of both technologies have limited payloads that would necessitate having a fleet of vehicles to provide comparable payload to a fleet of transport trucks. Although the heavy lift airship has the advantage of not requiring a cleared corridor, the hoverbarge would require clearing and corridor maintenance similar to that of a winter road. Overall, these technologies are not preferred.

The other modal alternative (rail) is also not preferred, primarily due to comparatively high capital costs and lack of a connection to any existing or proposed rail network.

In comparing a winter road upgrade to an all-season road, the all-season road option is preferred. Although it will result in higher capital and operations/maintenance costs, an all-season road will provide a safer and more reliable means of transporting goods and services throughout the year. This will maximize economic development opportunities, which, in turn, will maximize social and community benefits. There will be environmental effects resulting from the construction and operation of both types of road. Some argue that the recurring effects of annual construction of a winter road could be cumulatively greater than the initial construction impacts of an all-season road and the lesser ongoing impacts during operations. However, significant environmental effects of either type of road can be avoided through proper routing/alignment selection and/or can be sufficiently managed with mitigation to avoid significant effects.

One of the greater potential effects of an all-season road will be the development of aggregate supply sources. These impacts, and other impacts associated with construction and operation of an all-season road, will be examined in detail during the environmental assessment process.

Travel demand management mechanisms, such as modifying or reducing the need for travel by encouraging the use of alternatives to trip making, are deemed to be an auxiliary benefit of any long-term plan for introducing a corridor within which enhanced communications technology (broadband) can be installed, and can be implemented in combination with the supply road.

In addition to the foregoing rationale, developing a new all-season road between Webequie and the McFaulds Lake area is deemed to be the most reasonable alternative for the following reasons:

1) It best addresses the project purpose and objectives, as stated by Webequie First Nation, including providing new and enhanced opportunities to improve Webequie's economic and social well-being; and

2) Given current and projected available resources (people and financing), it is the likeliest alternative to be within Webequie's technical and economic abilities to implement. Funding sources will be further explored in subsequent stages of project development.

The selected planning alternative is also consistent with provincial government plans and policies for growth and development in the region, including the Ring of Fire area, as discussed in Section 1.4.

Therefore, in keeping with the focussed approach to the EA, the preferred planning alternative (developing a new all-season road) has been carried forward to the initial consideration of alternative methods of carrying out the Undertaking, which are addressed in Section 5.1.2 of the ToR. The Do Nothing option will also be carried forward as a comparator in the EA study for the purposes of assessing the overall

advantages and disadvantages of proceeding with the preferred method of implementing the Project in relation to maintaining the status quo (i.e., not addressing the stated purpose and objectives of the Project).

5.1.2 Alternative Methods of Carrying Out the Undertaking

Having identified the implementation of an all-season supply road as the preferred planning solution to fulfill WFN community objectives, this section of the ToR provides an initial examination of alternative methods of carrying out this plan. It should be noted that all alternative methods of implementing the Project are considered conceptual at this point, since limited design work has been conducted to date, and are referred to as "Alternative Concepts". Each road corridor under consideration is approximately 2 km in width, within which the supply road (35 m right-of-way) is located along the centreline of the corridor. The 2 km width provided flexibility in refining/developing centreline options for evaluation during the screening process. Details of this approach are presented in Section 5.1.2.3 below.

5.1.2.1 Background and Context

Section 1.3 and **Appendix A** of this ToR provide information on the various road/transportation studies that have been conducted in the Webequie First Nation/McFaulds Lake region over recent years. These studies included:

- Winter Road Re-Alignment Study (2008);
- Cliffs Ferroalloys Black Thor Mine Integrated Transportation System (2011);
- Noront Resources Eagle's Nest Mine Access Road (2013);
- All-Season Community Road Study (2016); and
- All-Season Community Road Study – Phase 2 (2017).

All of these investigations and initiatives provide context for the development of the Webequie Supply Road and have contributed inspiration to Webequie First Nation for the planning and development of the supply road, with the overarching goal being to bring socio-economic opportunities and prosperity to the community.

Table 5-1 provides a chronological summary of the foregoing studies and other decisions that have supported and led to the development of the Webequie Supply Road Project.

Table 5-1: Chronological Summary of Activities That Led to Development of Webequie Supply Road Project

Activity/Date/Status	Summary of Results/Decisions
Cliffs Ferroalloys Black Thor Chromite Mine, McFaulds Lake, Ontario **Ontario EA** Designation (voluntary agreement): Granted Date submitted: June 2, 2011 Decision date: August 5, 2011 Terms of Reference: Submitted Date submitted: July 27, 2012 Expiry of public comment period: August 26, 2012 - Terms of Reference (amended): Submitted Date submitted: January 25, 2013 _____ **Federal EA - CEAA** Reference Number: 63927 Federal Responsible Authorities: Fisheries and Oceans Canada, Natural Resources Canada and Transport Canada Proponent: Cliffs Natural Resources Inc. Environmental Assessment Commenced: September 22, 2011 Environmental Assessment Type: Transitional Comprehensive Study Status: Environmental assessment terminated prior to completion	Cliff's started its EA in June 2011. During the engagement and consultation process, Cliffs asked Webequie FN if it would consider being a proponent for a "secondary winter road, possibly, a future secondary all-season road" from Webequie FN's airport to the proposed mine site. At the time, it was believed by Cliffs that the Winter Road from Marten Falls FN to the proposed mine site was "untested terrain" and that Cliffs needed a "secondary Winter Road" in the event of a winter road breakdown during the mobilization of equipment and material at the pre-construction stage over the north-south Winter Road; then Cliffs would have a secondary Winter Road from Webequie FN's airport. Cliffs was willing to pay for the construction and maintenance of the secondary winter road. Cliffs had a conceptual route for the secondary winter road and came up to Webequie FN in a helicopter to fly over the conceptual route with Webequie FN land users and councillors and a new conceptual route was identified after the flyover from Webequie FN airport to the proposed mine site. This is one of the reasons why Webequie FN decided to do an Airport Re-Development project, so that it can capture economic development opportunities associated with the road to the proposed mine sites.
Noront Eagle's Nest Nickel-Copper-Platinum Mine, McFaulds Lake, Ontario **CEAA/Ontario EA Act** Project Description: Submitted April 2011 Ontario Terms of Reference (amended): Submitted October 2012. The notice of approval for the ToR included the requirement that Noront re-screen four road corridors. CEAA Environmental Impact Statement Guidelines: Issued January 2012 Draft EIS/EAR: Circulated by Noront in December 2013 with comments issued by federal	Noront Resources engaged Webequie First Nation to help identify a preferred alignment for an east-west transportation corridor running from Eagle's Nest Mine to the Pickle Lake area. Webequie assumed the responsibility for identifying a preferred alignment through their territory from Noront and, in doing so, conducted their own internal process of consulting with their community members. A preferred corridor alignment was identified and was subsequently used in the Webequie Community Supply Road Baseline Environmental and Geotechnical Studies Project (2017-18) to help form the preliminary preferred corridor for subsequent further review as

Activity/Date/Status	Summary of Results/Decisions
agencies. Ontario did not provide comments on the draft EIS/EAR, as the document was prepared in advance of the approval of the Terms of Reference and does not reflect the requirement to re-screen four road corridors. As such, the draft EIS/EAR was not deemed by MECP to have any formal status. Amended Terms of Reference: Approved 2015 Current Status of Federal and Provincial EAs: The Noront Provincial EA is currently on hold until there is more certainty about a potential all-season road connection to the provincial highway network to be developed by others. Noront will enter into discussions with MECP when it is ready to restart its EA process. As part of the transition to the new ***Impact Assessment Act*** on August 28, 2019, the Impact Assessment Agency of Canada issued a Notice of Termination of the federal EA under the former CEAA for the Eagle's Nest Project.	part of the Webequie Supply Road Environmental Assessment and Preliminary Engineering Project (2018 - ongoing).
All-Season Community Road Study (ASCRS) 2015-16	Study initiated by four communities in the Ring of Fire region (Eabametoong FN, Webequie FN, Nibinamik FN, Neskantaga FN) to gauge community interest and investigate route options (10 km wide corridors) for connecting the communities to the provincial road network. Nine corridor options were identified and evaluated in detail on the basis of many factors, including: construction cost, ease of connection between neighbouring communities, driving distance and terrain. Two communities, Neskantaga FN and Eabametoong FN, chose not to continue further with the planning process, while (approximately 6 months after completion of the ASCRS) Webequie FN and Nibinamik FN decided to continue the process via the Nibinamik-Webequie Community Road Baseline Environmental and Geotechnical Studies.
Nibinamik-Webequie Community Road Baseline Environmental and Geotechnical Studies (2017-18)	Nibinamik and Webequie FNs participated in baseline environmental and geotechnical studies along a preferred route linking the two communities with the provincial road network near Pickle Lake. Upon completion, Nibinamik FN decided it was not yet ready to proceed further with the planning process, while Webequie FN

Activity/Date/Status	Summary of Results/Decisions
	shifted its focus to baseline environmental and geotechnical studies for a supply road connecting the community with the McFaulds Lake mineral exploration area.
Webequie Community Supply Road Baseline Environmental and Geotechnical Studies (2017-18)	Project began with Webequie community-only meetings of various groups (i.e., youth, elders, land harvesters) to identify a preliminary preferred 2 km corridor alignment. Community members focused almost exclusively on the alignment of the north-south portion of the corridor, as they stated that they had previously identified their preferred east-west route as part of internal discussions to identify a suitable route for the Noront's Eagle's Nest transportation corridor. Once the community-preferred corridor was identified, preliminary baseline environmental and baseline studies were conducted along this alignment.
Webequie Supply Road Environmental Assessment and Preliminary Engineering (2018 - ongoing)	Webequie First Nation is a proponent for an environmental assessment and preliminary engineering study of a proposed 107 km supply road extending from its airport to the McFaulds Lake area. The 2 km wide preliminary preferred corridor is carried forward as part of the study.

These studies served as the foundation for the identification and initial assessment of alternatives for the proposed Webequie Supply Road. Further details of this assessment are provided in Sections 5.1.2.2, 5.1.2.3 and 5.2 below.

5.1.2.2 Alternative Supply Road Corridors

The Webequie Project Team began its investigations on how to implement the supply road project by examining options at a corridor level of detail. As described in the background/historical context narrative (Section 5.1.2.1), over the last decade, there has been extensive examination of alternative road corridors in and around the McFaulds Lake area, as well as alternatives for interconnecting future mine developments and remote First Nations to the provincial highway system. The outcome of these past studies in parallel to the Webequie Supply Road EA have further advanced the planning process towards the identification of alternative corridors and the ultimate future selection of a preferred all-season access road into the area of potential mineral resource development that would add potential benefits and opportunities for WFN.

As a result, the identification of the current alternative road corridors for the WSR EA is limited to those between the Webequie First Nation and the McFaulds Lake area.

5.1.2.3 Initial Identification of Webequie Supply Road Corridor Alternative Concepts

Community Based Land Use Plan

The initial identification of Webequie Supply Road corridor alternative concepts (Alternative Concepts 1 and 2; refer to **Figure 5.3**) is based on the results of previous studies, as well as years of joint community based land use planning work conducted by the Webequie First Nation in collaboration with MNRF, which is ongoing. This land use planning process includes incorporating and documenting land utilization patterns, sites of Indigenous cultural significance and historical and current traditional practices to establish a Webequie Community Based Land Use Plan (CBLUP) in the context of the Ontario *Far North Act*, which provides the authority, purpose, and process for Webequie First Nation community based land use planning. Webequie First Nation started the CBLUP process in 2011. An agreed upon Terms of Reference to develop a CBLUP was jointly signed by WFN and the MNRF in July 2014. The purpose of the Terms of Reference was to set out the practical matters and expectations for Webequie and MNRF to work together and, in consultation with neighbouring First Nation communities, produce the Webequie CBLUP. As such, the Terms of Reference provided a guide for the potential designation of a Webequie Planning Area; and direction on preparing the community based land use plan for that area.

It is important to understand that the WFN is a progressive community that has accepted the responsibility of becoming involved and undertaking a joint community based land use planning process. In this process, Webequie is bringing forward concepts of land use planning that date back several generations, concepts that involve consideration of the community and others. Today, these concepts are the foundation for Webequie's vision for planning. This vision is based on dialogue that has taken place for many generations on land use, and consideration of opportunities and benefits, and also applies protocols and teachings handed down from their ancestors, which has evolved into the Three-Tier planning approach (refer to **Section 10** of this ToR).

As part of the vision for the community, Webequie shows respect for neighbouring communities that have shared the land and, therefore, will incorporate shared interests in the development and implementation of the land use plan. Inherent to the Plan, Webequie has a belief that they are, in fact, stewards of the land and have the need and the right to live off the land. The elders and the community as a whole realize the importance of both development and protection. They also believe that living off the land for sustenance is vital to protect cultural heritage, while understanding that resources in the planning area (as well as in Webequie's broader area of interest) are valuable for the well-being and advancement of the community.

The Draft CBLUP currently in progress addresses the proposed Webequie planning area, providing recommendations for land use areas, land use designations, and activities that are permitted or not permitted in those areas. The Draft Plan recommends eight land use areas, with land use designations of Dedicated Protected Area, Enhanced Management Area and General Use Area (refer to **Section 6.3.6 – Land and Resource Use** for details on permitted/excluded uses in designated areas). All land use designations identified in the CBLUP developed to date are 'Draft' and subject to further revision.

A key planning subject in the Plan, which is relevant to the WSR, is infrastructure and community development. As such, the Plan considers and identifies infrastructure needs and opportunities for the community, potential infrastructure corridors (e.g., transmission lines, winter road upgrades, all-weather roads, fibre-optic lines), and other possible development needs (e.g., mining camps, and airstrips) and, specifically, will:

- Consider interests both within and beyond the planning area (e.g., with regard to alignment of primary corridors);
- Provide zoning within the planning area that will support desired opportunities and interests, and provide strategic direction to protect values and features; and
- Include information, direction or guidance on environmental, economic, social, and cultural interests that can inform and complement environmental assessment processes for corridors.

The Draft CBLUP notes that Webequie and neighboring First Nations have a strong interest in developing all-season road access and infrastructure connections to their communities, and are in the midst of leading studies and planning activities to facilitate this infrastructure, with a focus on access and infrastructure projects to support resource-based economic development, particularly in the mineral sector. It also cites all-season road options for Webequie in the areas west, south and east of the community, which may provide for synergies with access to nearby mineral sector projects. In this context, it is important to note that Marten Falls is in the process of preparing its own Community Based Land Use Plan and a portion of the project area is included in the Marten Falls Terms of Reference CBLUP planning area of interest (refer also to Section 6.3.6 Land and Resource Use for a description of overlapping/shared territories and related ongoing discussions between Webequie and Marten Falls). Further discussions between Webequie and Marten Falls, including a determination of how to proceed with zoning in overlapping planning areas will be required prior to either CBLUP being finalized.

Overarching Criteria for Development of Supply Road Alternatives

In keeping with MECP's Code of Practice for determining a reasonable range of alternative methods for implementing the Webequie Supply Road, the Project Team deliberations included the considerations in the table below:

Questions for Consideration	Response
Do the alternatives provide a viable solution to the problem or opportunity to be addressed	YES Pursuant to the assessment of alternatives to the Undertaking presented in **Section 5.1.1.1** of the ToR, construction of an all-season road constitutes the most viable solution for realizing the opportunities identified by Webequie First Nation.
Are they proven technologies?	YES Although winter roads have historically been the primary means of establishing major ground travel corridors in Ontario's Far North, they are becoming less reliable/safe due to climatic changes (i.e., they may only be operational for 2-3 weeks a year), and First Nation communities have started to participate in the planning and implementation of all-season roads (e.g., Wa-Pik-Che-Wanoog Bridge and North Caribou Lake segment of Northern Ontario Resource Trail). There are proven technologies for construction of all-season roads in the challenging geographical conditions that will be encountered on this project (e.g., use of styrofoam slabs and geotextile/geogrid in peat/muskeg soils).

Questions for Consideration	Response
Are they technically feasible?	YES Although more costly to build and maintain, as noted above, there are various technically feasible design and construction solutions for implementing all-season roads in Canada's northern regions.
Are they consistent with other relevant planning objectives, policies and decisions?	YES As stated in **Section 1.4.2** of the ToR and summarized in **Appendix A**, in addition to the mining context and potential economic development benefits of linking the WFN to the mineralized zone, the Webequie Supply Road is also relevant in the context of broader, long-term provincial growth, development and multimodal transportation initiatives in the region, including: the 2041 Northern Ontario Multimodal Transportation Strategy (Draft); the Growth Plan for Northern Ontario; and Ontario's Mineral Development Strategy.
Are they consistent with provincial government priority initiatives?	YES The all-season road alternatives under consideration during the ToR phase accounted for such initiatives as source water protection, resource (mineral) development, reducing greenhouse gas emissions, protection of endangered species and their habitat, enhancing communications links and reducing reliance on fossil fuels.
Could they affect any sensitive environmental features?	YES The development and screening of alternative road concepts accounted for potential effects on natural, cultural, and socio-economic environmental features and values deemed important by Webequie and other First Nation communities in the immediate vicinity of the Project (caribou habitat, culturally important natural and built features/landforms, areas used intensively for traditional activities, fish spawning areas, seasonal hunting areas, moose mating areas, community spring water sources), as well as potential effects to the broader environment (effects on businesses, archaeological sites and areas with archaeological potential, other sensitive land uses in the context of the WFN community based land use plan, air quality and noise).
Are they practical, financially realistic and economically viable?	YES In terms of, geographical location/extent and configuration, (107 km 2-lane gravel surface within a 35 m right-of-way), development of the alternative road concepts recognized and addressed existing physical constraints and opportunities, as well as financial limitations imposed by existing community

Questions for Consideration	Response
	resources and external public funding sources and mechanisms. In this context, they are considered practical, feasible and economically viable.
Are they within the ability of the proponent to implement?	YES Within the financial limitations imposed by existing community resources and potential external public funding sources and mechanisms, Webequie First Nation currently believes that it is capable of implementing the proposed all-season road concept. WFN is the proponent of the WSR Environmental Assessment. The proponent of road construction will be determined later in the project development process. WFN continues to have discussions with the Province on roles and responsibilities with respect to ownership and construction of the WSR.
Can they be implemented within the defined study area?	YES The practicality of implementing the Project within its established geographic bounds is addressed above (i.e., the Project can be physically constructed within the defined study area). The study area has been defined on the basis of the Webequie First Nation Draft Community Based Land Use Plan. As described in **Section 5.1.2.3** of the ToR, the Draft CBLUP has identified designated use areas within the Planning Area of Interest (PAI). The proposed project road corridor is compatible with the plan objectives and permitted uses for the designated areas within which it is situated. Therefore, there should be no conflicts in implementing the Project from an administrative perspective.
Are they appropriate to the proponent doing the study?	YES Webequie First Nation is the project proponent. Other First Nations in Ontario's Far North and in other Northern regions of Canada have participated in similar all-season road initiatives, although not as the primary proponent. The Project is situated wholly within WFN Reserve lands and/or the community's Draft CBLUP Planning Area of Interest, although peripheral parts of the PAI constitute recognized shared territory with other First Nation communities. Therefore, it is appropriate for WFN to assume proponency for the road corridor alternatives under consideration.
Are they able to meet the purpose of the *Environmental Assessment Act*?	YES The purpose of the *Environmental Assessment Act* is "the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise

Questions for Consideration	Response
	management in Ontario of the environment" (R.S.O. 1990, c. E.18, s. 2). There is a high degree of alignment between the purpose of the Act and purpose of the Project as stated in **Section 1.4.1** of the ToR, particularly with respect to bettering the quality of life for WFN community members by fostering employment and economic development opportunities (refer also to expected project benefits in **Table 7-1** in the ToR). Development of the road alternatives is consistent with these purpose statements. Further, the alternative road corridor concepts have been developed with a view to protecting environmental components of value to Webequie community members and other First Nations that share territory with Webequie (refer to the narrative below describing the development of alternative concepts and **Table 5-4** summarizing the screening of the alternatives). The location of the proposed road corridor within WFN Reserve lands and Webequie's PAI provides the opportunity for the community to assume and maintain a prominent role in managing the road facility in an environmentally responsible and sustainable manner.

Supply Road Alternative Concepts

In 2017, concurrently with the ASCRS - Phase 2 work, the Webequie First Nation conducted an initial examination of alternative corridors between Webequie First Nation and the McFaulds Lake area at a conceptual level, building on the past aforementioned studies and using a community based land use planning approach. This examination considered the input that WFN provided to Noront during the EA for the Eagle's Nest Mine from 2011 to 2014 and, specifically, the East-West corridor alternatives that connected the mine to the provincial highway system at Pickle Lake. This input involved a series of meetings (East-West Group) held between the WFN and Noront (August 2011 to September 2014), and involved a community based evaluation of route alternatives guided by the Webequie First Nation's Local Working Group, made up of community member land users, harvesters, elders, knowledge holders and youth representatives.

The WFN Local Working Group identified sensitivities and features of value for protection that should be avoided, derived from Indigenous Knowledge information and mapping, such as significant hunting areas for moose and caribou and known sacred, burial or spiritual significant sites, as well as respect for land use activities that are shared with neighbouring First Nation communities. In essence, this evaluation allowed for a comparison of the advantages and disadvantages of each alternative corridor. The outcome from this community based evaluation was provided to Noront and, along with input Noront received from other communities, was the basis for the preliminary preferred East-West corridor, as described in the 2013 Noront Draft EIS/EAR for the Eagle's Nest Mine.

From the above collective processes and past studies over several years that adopted a community based land use planning approach for infrastructure development, two (2) alternative all-season road concepts were identified and examined:

1) Alternative Concept 1 – running directly south from the community, following the existing winter road corridor, then east-west to the mineral deposit area near McFaulds Lake; and

2) Alternative Concept 2 – running southeast from the community, then east-west to the mineral deposit area near McFaulds Lake.

As noted above, these alternative methods of carrying out the Undertaking are considered "conceptual" at this point, since limited design work has been conducted to date. The alternatives are described in more detail below.

Both of these alternative methods for implementing the supply road corridor are consistent with the recommended land use areas and designations in the Draft Webequie CBLUP. Specifically, the alternatives are located primarily in the designated "General Use Area" (GUA) and "Other Areas", with a minor segment located within an "Enhanced Management Area" (EMA).

Alternative Concept 1 – Directly South from Webequie and then East-West to the McFaulds Lake Area

The southern interconnection alternative from Webequie First Nation to the proposed East-West section largely follows an old winter road corridor, and was developed during preparation of the Noront Project Description (federal EA) and is documented in their Draft EIS/EAR, with input provided by WFN. The north-south interconnection was proposed to traverse from the south side of the community to intersect with East-West section of the proposed all-season road at a location referred to as "Webequie Junction", when Noront was considering a combined winter road/all-season road with load-out facilities at Webequie Junction.

Webequie Junction was an important intersection for Noront's proposed Eagle's Nest mine project. It was at this location that Noront initially proposed to transition the East-West road from a winter road and slurry pipeline running from the mine site west to Webequie Junction, to an all-season road that would largely follow the existing winter road to an intersection with Highway 599 near Pickle Lake.

Through the community based land use planning process, Webequie community members were engaged in the selection of the southerly link between the community and Webequie Junction, as well as the corridor for the East-West winter road from Webequie Junction into the Eagle's Nest mine site through the Noront Eagle's Nest EA process (2011 - 2013).

Ultimately, an all-season road from Eagle's Nest to the provincial highway system at Pickle Lake was selected as the preliminary preferred road option by Noront Resources in their draft EIS/EAR (2013), which is currently on hold.

Detailed field studies, including biological studies, a Stage 1 archaeological assessment, hydrological studies, geotechnical studies, and other investigations required to support the Noront EA process were conducted to characterize and confirm the constructability of the all-season road and to minimize environmental impacts. Indigenous Knowledge data were also provided by the Webequie First Nation and incorporated into the analysis.

Three alternative corridors between Webequie Junction and Eagle's Nest were examined by Noront that relied on the evaluation and analysis by the Webequie First Nation with respect to avoidance of known features and sensitivities of value to the community, resulting in selection of a preliminary preferred East-West alignment for the all season road.

The southerly connection between the Webequie First Nation and Webequie Junction was not analyzed in the same detail as the alternative East-West corridor alignments to the east of Webequie Junction. However, the old winter road corridor was selected by members of the Webequie First Nation based on the fact that it would not result in impacts to historic sites or areas of cultural significance. It also minimized potential impacts to traditional land uses and important environmental resources.

Alternative Concept 2 - East and South of the Community and then East-West to the McFaulds Lake Area

The initial identification of the east corridor concept (Alternative Concept 2) occurred during studies conducted concurrent to the ASCRS – Phase 2 investigations. Without confidence that Noront's proposed East-West corridor would be the preferred mine access road, and uncertainty that the east-west community road had the necessary support of other First Nations, Webequie leadership has chosen to examine an alternative road corridor that would connect with the community on the east side of the reserve (at the Webequie Airport), and then to the corridor identified by Webequie as the preferred routing for the East-West segment of the all-season road to the mineral deposit area near McFaulds Lake.

Engagement was conducted by Webequie land use planning staff with community land users, elders and community members. In addition to input received through engagement, information from the Webequie CBLUP was used to identify a general corridor concept (initially 5 km in width) that is consistent with the permitted land uses designations in the Draft CBLUP and that avoids lands with significant historic and cultural value, while also minimizing impacts to environmentally sensitive features, such as watercourse crossings and wildlife habitat, and maximizing constructability through proximity to well drained soils (eskers).

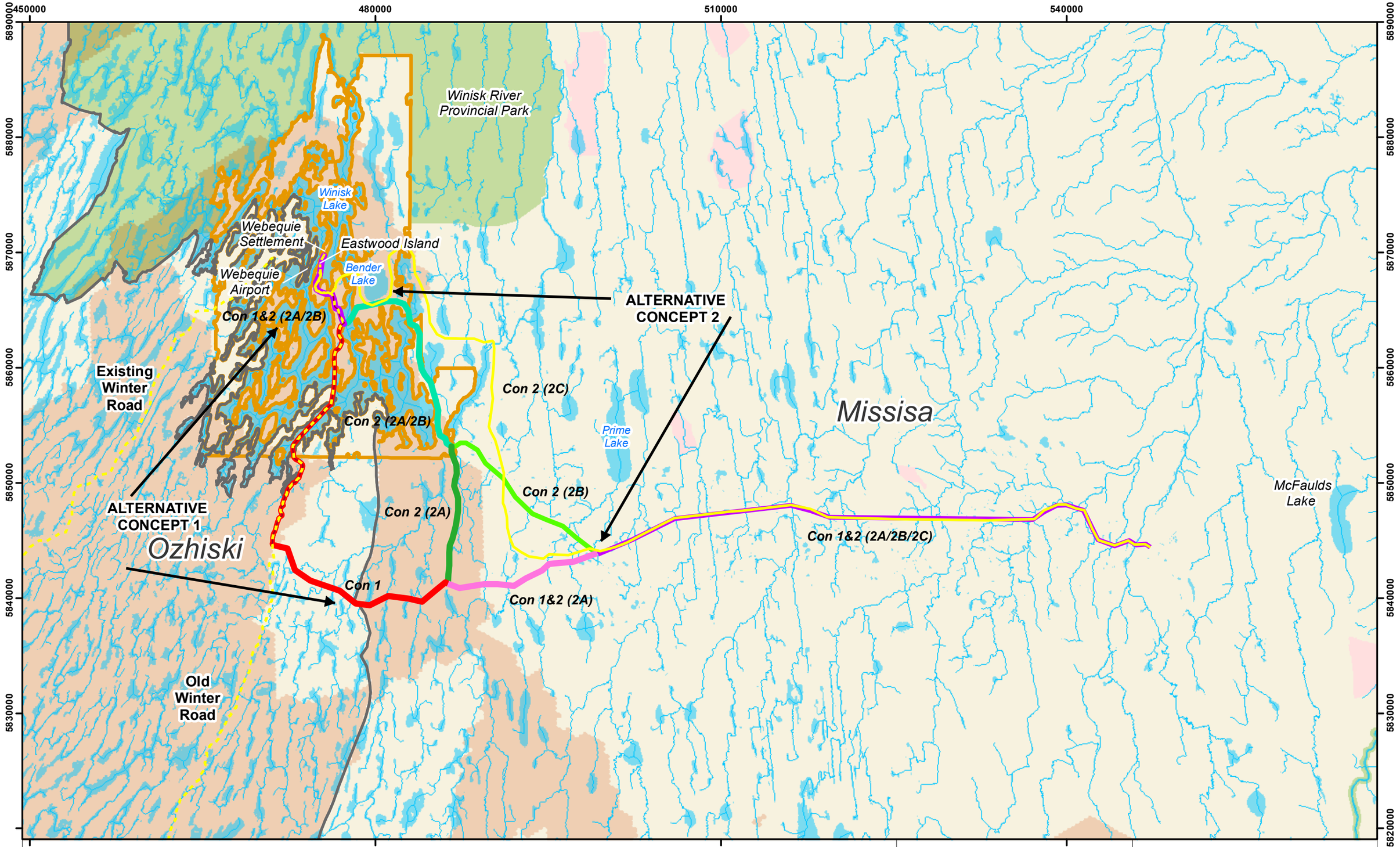
In August 2017, the community engagement consultant and technical consultant conducting baseline fieldwork for ASCRS - Phase 2 visited the Webequie community. Additional in-community meetings were conducted by the consultants in Webequie on October 3 and November 16, 2017 for the purposes of keeping community members aware of project activities and providing them with the technical materials to support intra-community engagement. An off-reserve meeting was also conducted by the consultants on October 26, 2017 in Thunder Bay.

Internal community discussions led by the appointed community coordinator for the Project refined segments of Alternative Concept 2. No refinements to Alternative Concept 1 were made, since this option comprises the old winter road corridor. The community member discussions included various age groups (both independently and together), harvesters and land users, as well as the hereditary chiefs. In order to finalize a preferred corridor, an intense consultation process, involving one-on-one interviews with over forty community members, was conducted between September 28 and October 3, 2017. Participation in the discussion included the use of interactive mapping, with the opportunity to sketch alternatives for the supply road.

The community discussions resulted in the identification of three sub-alternatives for Alternative Concept 2 – Alternatives 2A, 2B and 2C.

Alternative Concepts 1, 2A, 2B and 2C are shown in **Figure 5.3**.

As indicated at the outset of Section 5.1.2, each corridor under consideration (i.e., 1, 2A, 2B and 2C) is approximately 2 km in width, within which the supply road (35 m right-of-way) depicted by the respective coloured line, is located along the centreline of the corridor. These were deemed to constitute a reasonable range of options for addressing the aforementioned project objectives identified by Webequie First Nation. The 2 km width provided flexibility in refining/developing centreline options for evaluation during the screening process.



Legend

Road Alignment Alternatives
- Alternative Concept 1 and 2 (2A/2B)
- Alternative Concept 2 (2A/2B)
- Alternative Concept 2 - Corridor Alternative (2A)
- Alternative Concept 2- Alternative 2C
- Alternative Concept 1
- Alternative Concept 1 and 2 (2A)
- Alternative Concept 2- Corridor Alternative 2B

Boreal Caribou Habitat
- Category 1 - High Use Area (Nursery Use Area)
- Category 1 - High Use Area (Winter Use Area)
- Category 2 - Seasonal Range
- Category 3 - Remaining Areas within the Range
- Winisk River Provincial Park
- Webequie First Nation Reserve
- Winter Roads (Existing and Abandoned)
- Caribou Range Boundary

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Corridor Alternative Concepts for the Webequie Supply Road

Date: 2020-03-11	File Number: 649920	Sub Code: 0000
Figure Number: 5.3		Rev. 0

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5.2 Initial Screening of Webequie Supply Road Corridor Alternative Concepts

The alternative methods of carrying out the Undertaking (all-season road Alternative Concepts 1, 2A, 2B and 2C) were screened to identify a corridor upon which to focus investigations during the environmental assessment. The process for screening the alternatives included an assessment of the advantages and disadvantages of the alternatives against a set of factors that were identified based on both discussions with community members as to project area features and sensitivities that may be affected by the Project and what constituted valued components from the outcome of several community meetings in 2017 and 2018, and criteria inherent in the broader definition of the environment, as required under the EA Act and in accordance with MECP's Codes of Practice.

Based on a consolidated Indigenous Knowledge database prepared by WFN, and information assembled from published sources and field investigations completed to date relative to project area sensitivities, the Webequie community based considerations (valued components) presented in **Table 5-2** were accounted for in developing the evaluation criteria against which the alternative road corridor concepts were screened during the Terms of Reference phase.

Table 5-2: Webequie Community Based Considerations for Screening Alternative Methods

Consideration	Factor/Screening Criterion
Caribou (Boreal population)	
The Missisa Caribou range is considered continuous and spans the ecotone between the Ontario Shield Ecozone and Hudson Bay Lowland Ecozone (MNRF, 2014). The minimum Caribou population in the Missisa Range was estimated at 745 based on winter distribution surveys completed from 2009 through 2013 (MNRF, 2014). A combined low mean annual survival estimate (80%) and low calf recruitment indicates the population was on a declining trend at the time of data collection (MNRF, 2014). Caribou (Boreal population) is a "Threatened" species under the Ontario Endangered Species Act and the federal Species at Risk Act. Only the boreal population of Caribou is listed as a species at risk in Ontario. Caribou require large undisturbed areas of old and mature conifer upland forest and lowlands dominated by jack pine and/or black spruce. They are also found in bogs and fens. Both of these habitat types exist in proximity to the alternative road corridor concepts, as do known caribou travel corridors and nursery areas. Caribou habitat disturbance has become a systemic problem across Canada, which is a significant issue given the amount of time it takes for habitat recovery (deemed to be in excess of 100 years by some First Nation elders).	***Factor 1:*** ***Caribou habitat:*** Community members want to avoid fragmentation of caribou habitat potentially caused by the road corridor.
Natural or Built Features	
There are natural or built features (e.g., hill, historical campsite or cabin) situated on the lands surrounding the built-up area of Webequie community that are important to individual community members, or to the community as a whole. These features may serve as locations for ceremonial rites, storytelling, spiritual	***Factor 2:*** ***Culturally significant features***

Consideration	Factor/Screening Criterion
reflection, or recreational activities; they may be the site of a historically important event; or they may provide shelter during periods when individuals or groups are away from the main community area for several days at a time. Community members have assigned high cultural significance to these features.	***(natural or built):*** Community members do not wish to have these features disturbed in any way.
Traditional Use Areas	
There are numerous locations in close proximity to the built-up area of Webequie that are used intensively and regularly by community members for traditional activities, such as hunting, fishing and resource harvesting/gathering. These areas are important not only because they are rich in fish, wildlife and other resources, but they require fewer costly and supply-limited resources (such as fuel) to reach because of their proximity to the community. These areas may be isolated or grouped in close proximity to each other.	***Factor 3:*** ***Areas used intensively for traditional activities:*** Community members wish to preserve these areas intact.
Fishing	
The Project area is situated within tertiary watersheds of the Winisk, Ekwan and Attawapiskat Rivers. Webequie is situated on Eastwood Island, surrounded by numerous waterbodies that support fish and fish habitat, and provide subsistence and recreational fishing for the community. Fish species that inhabit the river systems include Brook Trout, Cisco, Northern Pike and Walleye (known colloquially as Pickerel). Lake species include Smallmouth Bass, Lake Whitefish, Yellow Perch, Lake Sturgeon and Common White Sucker, as well as many smaller forage fish species. Protection of areas where these fish spawn is critical to the preservation of this important resource.	***Factor 4:*** ***Fish spawning areas:*** Community members are well aware of local fish spawning areas and their associated species, and wish these areas to remain undisturbed.
Hunting	
Wildlife in the project area comprises a number of terrestrial and waterfowl species that are hunted/trapped by members of Webequie and other communities for subsistence use. These include moose, caribou, beaver, snowshoe hare, marten, ducks and geese. Certain areas have habitat characteristics that make them popular seasonally for hunting, such as areas where waterfowl will stage during the period of early spring when open water begins to appear (e.g., north shore of Bender Lake). Webequie community members frequent these areas and have established infrastructure to facilitate hunting activities (e.g., blinds, campsites). Community members recognize that the noise and movement of vehicles during waterfowl staging periods could impact these areas significantly.	***Factor 5:*** ***Seasonal hunting areas:*** Community members wish these areas to be remote or buffered from the road corridor.

Consideration	Factor/Screening Criterion
Moose	
Moose are an important subsistence species for Webequie First Nation. During the moose-rutting (mating) season (September-October) moose are found in different areas than during other seasons. Before the bull moose go into rut, they are usually found in the higher elevation areas. They will seek out cooler and thicker areas of the forest, trying to escape insects and predators. Cow moose and their calves will stay in the lowlands near water. The cows seek out water for food and safety. Calves are vulnerable, especially to wolves and bears; a cow with calf will use the water as an escape when threatened by predators. The amount of daylight (or lack thereof) triggers the rut. When the moose rut begins, and likely for a few weeks before the beginning of the cow moose estrous, the bulls will move down out of the higher elevations to seek out the cows. The bulls will stay in the lower and wetter areas within proximity of the cows to engage in mating. The moose gestation period is in the order of 243 days. The rutting/mating areas are well known to Webequie community members, who understand that the areas have unique habitat characteristics and play a major role in supporting the breeding process.	**Factor 6:** **Moose mating areas:** In order to sustain the moose population, community members wish to ensure that the road corridor avoids these areas.
Source Water	
Source water is untreated water taken from rivers, lakes or underground aquifers to supply private and public drinking water systems. The Ontario Clean Water Act, 2006 is part of the multi-barrier approach to ensure clean, safe and sustainable drinking water for Ontarians, by protecting sources of municipal drinking water such as surface water and groundwater. Surface water is water that lies on the Earth's surface in the form of lakes, rivers and streams. It is drawn into a drinking water system through an intake pipe. Surface water is easily contaminated by pollution flowing over the land or directly into lakes, rivers and streams. Groundwater is the water beneath the Earth's surface, found in the cracks and spaces between soil, sand and rock particles. It is drawn into a drinking water system through a well. Surface water and groundwater can be interconnected, with pollutants finding their way from one to another. Groundwater can also be contaminated by pollutants that are deposited on the surface soil or underground. Groundwater contamination can be much more difficult than surface water pollution to remediate*. There is a significant community source of spring water (groundwater) located 10-15 km southeast of the community. Spring water is used by the community for ceremonial purposes, and some community members use this as a potable water source. Community members recognize the importance of protecting its sources of drinking water, and the potential for the road construction and operation to adversely affect the spring water source area, either directly through excavation activities, or through connections with surface water runoff.	***Factor 7:*** ***Community source of spring water:*** It is important to community members that the corridor be a significant distance from this valuable resource.

* CTC Source Protection Region website: https://ctcswp.ca/the-facts/source-water-protection-in-ontario/.

In addition to the community based traditional land and resource use evaluation criteria, the alternative methods of carrying out the Undertaking were screened against criteria inherent in the broader definition of the environment (presented in **Table 5-3**), as required under the EA Act and in accordance with MECP's Codes of Practice. These and the community's considerations were integrated for the purposes of an initial screening of the all-season road corridor options.

Table 5-3: Additional Considerations Used to Screen Alternative Methods

Consideration	Factor/Screening Criterion
Socio-Economic Environment	
New or relocated roads can displace all or part of existing businesses, or otherwise affect economic viability by changing (reducing or increasing) physical access or visual exposure to passing traffic. Although Webequie First Nation holds the position that provincially registered traplines do not represent spatial limits of traditional use by their members, for the consideration of business interests, it can be stated that the project area intersects traplines registered to Webequie First Nation and Marten Falls First Nation community members. There is limited potential for other effects, since businesses outside the built-up area of Webequie are limited to outfitters' sites generally located in or near Winisk Provincial Park to the north of the Webequie, well removed from the immediate project area.	***Factor:*** ***Business Impacts - Licensed traplines & outfitters***
Cultural Heritage Resources/Environment	
To complement the value attributed to WFN's Natural or Built Features, the following criteria were included to address the considerations that will be important to the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) in assessing the effects of the Project:	***Factors:***
○ Effects on registered archaeological sites, and consideration of areas of archaeological potential, recognizing MHSTCI criteria to identify archaeological potential, where applicable (i.e., proximity to waterbodies or historical travel routes).	***Archaeological potential***
○ Effects to built heritage resources (e.g., old hunting, fishing or trapping camps) and cultural heritage landscapes features (natural; built; sacred or spiritual) identified by Indigenous communities and others.	***Built heritage resources***
○ Effects to recognized burial sites in the context of the *Funeral, Burial and Cremation Services Act* and possible involvement by the Registrar, Burials of the Ministry of Government and Consumer Services (MGCS) and as identified by Indigenous communities.	***Burial sites***
Built Environment	
The supply road is an infrastructure component that WFN would like to integrate with its community land use initiatives. It will also constitute an additional use on lands administered by Canada. Important considerations in these regards are the effects on/compatibility with sensitive land uses that are being contemplated in WFN Draft Community Based Land Use Plan developed to date, and sensitive	***Factors:*** ***Webequie Community Based Land Use***

Consideration	Factor/Screening Criterion
uses on (federal) Reserve lands within the framework of the WFN Comprehensive Community Plan being prepared under the auspices of Crown-Indigenous Relations and Northern Affairs Canada. These two plans are considered together in the context of land use planning aspirations.	***Plan*** ***First Nation reserve land***
Natural Environment	
To meet EA legislative requirements broad effects on surface water; air quality; the acoustic environment; and the project's potential to affect/be affected by climate change, the number of waterbody crossings and potential impacts to water quality; generation of greenhouse gases; and generation of noise emissions have been included as considerations.	***Factors:*** ***Air*** ***Noise*** ***Waterbody crossings***
Technical Considerations	
Soil conditions in the project area comprise primarily rock and muskeg/peat, with limited workable overburden soil, and construction will require installation of numerous waterbody crossings. Constructability is related principally to how challenging it will be to construct the road in such conditions and whether there are discernible differences amongst alternatives in this regard. Another typical constructability element is how construction will be staged over time and the length of the road corridor. This consideration was excluded, since it is expected that staging will be similar for all alternatives. Capital and operating costs are considerations for how the road will be financed/funded, and are expected to be directly related to the length of the road, but will also include consideration of waterbody crossings and soil conditions. Construction capital costs have been estimated on a preliminary basis, but operating and maintenance costs are excluded, since the business model for that phase of the Project has not been established.	***Factor:*** ***Constructability and cost***

Data sources for the above factors were derived from the Indigenous Knowledge database prepared by WFN, review of published secondary sources (as citied in **Section 6.1** of this ToR) and, more specifically, SNC-Lavalin professional knowledge and project experience with regard to the technical considerations related to constructability and cost.

Table 5-4 presents a summary of the comparative analysis results, which identifies the advantages and disadvantages of the all-season road corridor options relative to the aforementioned factors.

Table 5-4: Summary Comparative Analysis of Supply Road Corridor Alternative Concepts

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
Socio-Economic Environment									
Business impacts - Licensed traplines & outfitters	All of the alternative concepts intersect licensed traplines; however, Alternative 2C is considered to have a minor advantage, as it intersects fewer known traplines in comparison with the other alternatives. Local outfitters (i.e., escorted fishing and hunting tours) are active on lands to the west of Webequie First Nation and are not known to utilize those lands occupied by the subject alternatives; therefore, all the alternatives are considered equal in that no effects to outfitters are anticipated.								
Areas used intensively for traditional activities (socio-economic and cultural)	-	Alternative runs through traditional use area for 10-20 km	-	Alternative runs through traditional use area for 10-20 km	-	Alternative runs through traditional use area for 10-20 km	Alternative runs through traditional use area for 10-20 km, but these areas are generally less intensively used due to their further proximity from the community of Webequie	-	Alternative 2C offers minor advantage for this factor in comparison to Alternatives 1, 2A and 2B
Seasonal hunting areas	-	Alternative runs very close to significant hunting areas (e.g., waterfowl, moose, etc.) well known to community members	-	Route runs very close to significant hunting areas (e.g., waterfowl, moose, etc.) well known to community members	-	Route runs very close to significant hunting areas (e.g., waterfowl, moose, etc.) well known to community members	Route is further east and away from significant hunting areas (e.g., waterfowl, moose, etc.) well known and used by community members	-	Alternative 2C offers an advantage for this factor in comparison to Alternatives 1, 2A and 2B
Cultural Heritage Resources/Environment									
Archaeological potential[1]	All of the alternative concepts exhibit archaeological potential using the Checklist Criteria for Evaluating Archaeological Potential, Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (2015)[1]. Therefore, no one alternative is considered to have a comparative advantage or disadvantage for this factor. To assess potential effects to archaeological resources, it is proposed that a Stage 1 Archaeological Assessment be undertaken, which will involve consultation with Indigenous communities, review of existing published data sources and information obtained from stakeholders and agencies.								
Burial sites	-	In close proximity to known burial sites	No known burial sites are present	-	No known burial sites are present	-	No known burial sites are present	-	Alternatives 2A, 2B and 2C are similar for this factor and have a comparative advantage over Alternative 1
Built heritage resources (e.g., old hunting, fishing or trapping camps) / Cultural heritage	-	Land user's cabin and hunting blinds are along proposed route	-	In close proximity to known spiritual significant site (Sacred Hill)	-	Land user's cabin is directly along proposed route	Avoids land user's cabin	-	Alternative 2C is preferred, as it minimizes effects to known built heritage resources/cultural heritage landscapes (i.e., cabins, hunting blinds, sacred sites)

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
landscapes (natural; built; sacred, or spiritual sites)				Land user's cabin is directly along proposed route					in comparison to Alternatives 1, 2A and 2B
Built Environment									
Webequie Community Based Land Use Plan/CCP	All of the alternative concepts are consistent with the recommended land use areas and designations in the Webequie Draft CBLUP/CCP; therefore, no one alternative is considered to have a comparative advantage or disadvantage for this factor.								
First Nation reserve land	-	Approx. 37 km of the concept route is within Webequie First Nation Reserve lands	-	Approx. 27 km of the concept route is within Webequie First Nation Reserve lands	Approx. 21 km of the concept route is within Webequie First Nation Reserve lands	-	Approx. 17 km of the concept route is within Webequie First Nation Reserve lands	-	Alternative 2C is considered to a have comparative advantage to the other alternatives for this factor
Natural Environment									
Air	The effects of all alternatives on the potential to contribute to adverse climate change (through greenhouse gas emissions), or be affected by climate change (e.g., exposure to flooding), are relatively similar due to their proximity to each other for a component that is assessed at a regional or sub-regional level. Based on the project schedule (a 6-month Site Preparation period would be followed by a 33-month Construction Period, with Operations commencing immediately after commissioning), the preliminary estimate of greenhouse gas emissions attributable to the Project during construction is 73.2 kilotons of CO_{2eq}, and during the operations phase the annual contribution would be 11.8 kilotons of CO_{2eq}. These contributions in relation to Ontario and Canada-wide totals and future targets are below 0.05%.								
Noise	All of the alternatives have similar potential effects with to respect noise level and spatial extent as a result of equipment and vehicle emissions during site preparation, construction and operation phases of the Project. Therefore, no one alternative is considered to have a comparative advantage or disadvantage for this factor. Noise levels will be managed using Best Management Practices, such as use of proper equipment and adherence to manufacturers' specified maintenance frequencies.								
Caribou (Boreal population) – Species at Risk *Range Condition (includes cumulative disturbance, alignment with existing or proposed disturbance)*	Utilizes currently disturbed/ regenerating lands instead of intact forest Passes through both Ozhiski and Misissa Ranges, reducing cumulative effects to Misissa range compared to other alternatives	Longest alternative and, thus, greatest total contribution to permanent infrastructure and cumulative dirsturbance to to range condition	Passes through lands currently disturbed by human presence along shores of Winisk Lake and cabins present, instead of intact forest, reducing cumulative effect	Entire alternative occurs within Misissa Caribou Range	Passes through lands currently disturbed by human presence along shores of Winisk Lake and cabins present, instead of intact forest, reducing cumulative effects Shortest alternative and, thus, lowest total contribution to permanent	Southernmost portion of road runs through known caribou habitat	-	Alignment has the lowest degree of existing disturbance Represents the greatest cummulatve disturbance effect to Misissa Caribou Range	Alternative 1 is considered to a have comparative advantage relative to the other alternatives

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
					infrastructure and cumulative disturbance to range condition				
Caribou *Habitat protection (area, arrangement, and condition)* *Category 1 habitat – Nursery, winter use and travel corridors* *Category 2 habitat – Seasonal range* *Category 3 habitat - Remaining areas in range*	Avoids possible barrier effect between Winisk Lake and lands to the east Minimizes footprint within Category 2 habitat	Longest project alternative (112.9 km), resulting in greatest overall removal of Caribou habitat	Route skirts western edge of Category 2 habitat areas and minimizes severity of fragmentation Less barrier effect between Winisk Lake and lands to the east, compared to 2B	Contributes to barrier effect between Winisk Lake and lands to the east	Shortest project alternative (95.2 km), resulting in lowest overall removal of Caribou habitat Minimizes footprint within Catergory 2 habitat Route skirts western edge of Category 2 habitat areas and minimizes severity of fragmentation	Contributes to barrier effect between Winisk Lake and lands to the east	Avoids possible barrier effect between Winisk Lake and lands to the east	Arrangement results in greatest vegetation clearing within undisturbed upland habitat in Category 2 habitat	Alternative 1 is considered to a have comparative advantage relative to the other alternatives
Caribou habitat protection (direct impact to Category 1, 2, and 3 habitats)	No direct impacts to Category 1 habitat (General Habitat Description - GHD mapping) Comparable (72.7 km) to the shortest length through Category 2 habitat Likely lowest immediate impact to Caribou habitat	Minimizes effects to Category 1 and 2 habitats, but does not fully avoid Catergory 2 habitat 40.2 km of this alternative passes through Category 3 habitat (GHD mapping), contributing the the longest total alternative (112.9 km)	No direct impacts to Category 1 habitat (GHD mapping) The shortest length passing through of Category 2 habitat (71.9 km; GHD mapping)	Minimizes effects to known caribou habitat areas, but does not fully avoid 32.6 km passes through a single Category 3 habitat area (GHD mapping)	No direct impacts to Category 1 habitat (GHD mapping) GHD mapping indicates that 19.2 km of this alternative passes through Category 3 habitat Shortest total alternative (95.2 km; GHD mapping)	Moderate length of impact to Category 2 habitat (76.0 km), but does not fully avoid	No direct impacts to Category 1 habitat (GHD mapping) GHD mapping indicates that this alternative passes through 21.4 km of Category 3 habitat	Greatest length of impact to Category 2 habitat (85.9 km; GHD mapping) Second-longest alternative (107 km) Likely greatest immediate impact to Caribou habitat	Alternative 1 is considered to a have comparative advantage relative to the other alternatives

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
Caribou species protection *(direct mortality due to anthropogenics impacts, and indirect impacts)*	Shorter total length through Category 2 habitat may lower risk of vehicular collisions, limit Moose and Wolf dispersement and limit risk of predation, spread of disease and sensory disturdance in areas of greater Caribou occurrence	Route advantages are short-term and longer total length may create greater lasting risks to Caribou Improves species protection compared to other alternatives, but does not fully avoid adverse effects	Route skirts eastern shore of Winisk Lake through area already disturbed by humans Caribou occurrence may be lower in this areas, reducing risk of collisons compared to 2B and 2C Winisk Lake provides easy movement to this areas for predatory species (i.e., Wolf) that may impose increase risk of direct mortality of Caribou	Improves species protection compared to other alternatives, but does not fully avoid adverse effects	Route skirts eastern shore of Winisk Lake through area already disturbed by humans. Caribou occurrence may be lower in this area, reducing risk of collisons compared to 2C Winisk Lake provides easy movement to this areas for predatory species (i.e., Wolf) that impose increase risk of direct mortality of Caribou	Alignment of 2B may allow for greater ease of access for predators and hunters into undisturbed woodlands and peatlands, compared to 1 and 2A	-	Does not align with existing disturbance to the extent of other alternatives Alignment of 2C may allow for greatest ease of access for predators and hunters into undisturbed woodlands and peatlands, which offer seasonal refuge to caribou	Alternative 1 is considered to a have comparative advantage relative to the other alternatives
Other Species at Risk from preliminary determination of presence (Bald Eagle; Barn Swallow; Bank Swallow; Evening Grosbeak, Canada Warbler; Common Nighthawk; Rusty Blackbird; Olive-sided Flycatcher; Wolverine; Little Brown Myotis and Lake Sturgeon)		Longest total length of road, resulting in greater removal of habitat Represents loss of a portion of diverse upland habitat and associated significant wildlife habitat (Bat roosting habitat)	Minimizes total length of the road through Olive-sided Flycatcher habitat and passes through areas already disturbed by human presence near Winisk Lake (cabins)	Represents loss of a portion of diverse upland habitat and associated significant SAR habitat (Bat roosting habitat)	Minimizes total length of the road through Olive-sided Flycatcher habitat and passes through areas already disturbed by human presence near Winisk Lake (cabins)	Represents loss of significant SAR habitat (Rusty Blackbird and Olive-sided Flycatcher)	Minimizes total length of the road through Olive-sided Flycatcher habitat and passes through areas already disturbed by human presence near Winisk Lake (cabins)	Represents loss of significant SAR habitat (Rusty Blackbird and Olive-sided Flycatcher)	Alternatives 2A, 2B and 2C are similar with respect to potential effects to species and habitat and have a comparative advantage relative to Alternative 1

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
Moose mating areas	-	Intersects broad moose mating area south of community	-	Intersects broad moose mating area south of community, but to a lesser extent than Alternative 1	-	Intersects moose mating area south of community	Minimizes the intersect with moose mating area south of the community	-	Alternative 2C has a comparative advantage to Alternatives 1, 2A and 2B, as it intersects moose mating areas to a lesser degree
Fish and fish habitat	-	Alternative runs very close to significant fish spawning areas well known to community members Alternative has high potential effect to fish spawning areas, as it has highest number of waterbody crossings and route length where structures are required to cross waterbodies	-	Alternative runs very close to significant fish spawning areas well known to community members	-	Alternative runs very close to significant fish spawning areas well known to community members	Alternative minimizes potential effects to fish and fish habitat (spawning areas), as it has fewer waterbody crossings and shortest route length where structures are required to cross waterbodies	Alternative runs very close to significant fish spawning areas well known to community members	Alternative 2C is considered to a have comparative advantage relative to the other alternatives
Waterbody crossings (lakes and rivers)	-	Alternative 1 has 49) waterbody crossings Approx. 7.7 km of alternative route length will require structures to cross waterbodies	Alternative 2A has 36 waterbody crossings Approx. 1.42 km of alternative route length will require structures to cross waterbodies	-	Alternative 2B has 31 waterbody crossings Approx. 1.40 km of alternative route length will require structures to cross waterbodies	-	Alternative 2C has 26 waterbody crossings Approx.0.56 km of alternative route length will require structures to cross waterbodies	-	Alternative 1 has the longest route length crossing over waterbodies, and requires a greater number and/or span length for structures in comparison to Alternatives 2A, 2B and 2C. The route length requiring structures to cross waterbodies is considered similar for Alternatives 2A and 2B Alternative 2C is preferred for this factor, as it has the lowest number of waterbody crossings and shortest length that requires structures (i.e., culverts, bridges) to cross waterbodies
Community source of spring water	Distant from community source of spring water	-	-	Close to community source of spring water	-	Close to community source of spring water	-	Close to community source of spring water	Alternative 1 is preferred for this factor

FACTOR	ALTERNATIVE CONCEPT 1		ALTERNATIVE CONCEPT 2A		ALTERNATIVE CONCEPT 2B		ALTERNATIVE CONCEPT 2C		RESULTS OF COMPARISON
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	
Technical Considerations									
Constructability	-	North-south section (old winter road) of Alternative 1 has constructability issues due to extensive length of waterbody crossings and poor soil and terrain conditions	-	Conditions in this alternative route include extensive organic terrain of bogs and fens that represent a constructability challenge	-	Conditions in this alternative route include extensive organic terrain of bogs and fens that represent a constructability challenge	-	-	Alternative 1 has the greatest constructability challenges in comparison to Alternatives 2A, 2B and 2C due to length of waterbody crossings All Alternatives share poor soil and terrain conditions (bogs and fens) where there is a common east-west routing direction Alternatives 2A, 2B and 2C have similar constructability issues with respect to soil and terrain; therefore, no one alternative is considered have a comparative advantage
Cost	Alternative 1 is 113 km in length Preliminary estimated capital cost is $238.75 million dollars		Alternative 2A is 104 km in length Preliminary estimated capital cost is $106.40 million dollars		Alternative 2B is 95 km in length Preliminary estimated capital cost is $99.25 million dollars		Alternative 2C is 107 km in length Preliminary estimated capital cost is $91.45 million dollars		Alternative 1 has the highest preliminary capital cost Alternative 2C has a lower cost in comparison to Alternatives 1, 2A and 2B Alternative 2C is preferred for this factor, as it has the lowest preliminary cost

Notes:

[1] Source used to determine archaeological potential is Criteria for Evaluating Archaeological Potential (A Checklist for the Non-Specialist), Ministry of Heritage, Sport, Tourism and Culture Industries (2015). Specifically, an answer of "Yes" was identified for the following questions of the checklist and, therefore, the corridor was deemed to have archaeological potential, with a requirement to be subject to an assessment undertaken by a licensed consultant archaeologist.

1. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?
2. Are there present or past waterbodies within 300 metres of the property (or project area)?

Note for 2: Waterbodies (lakes, rivers, streams, springs, etc.) are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of waterbodies.

The screening of alternative corridor concepts concluded that an easterly corridor (Alternative Concept 2C) is more favourable than Alternatives 1, 2A and 2B. The preliminary preferred corridor (Alternative 2C is shown in **Figure 5.4**. The summary rationale for selection of Alternative 2C is presented in **Section 5.3**.

470000 480000 490000 500000 510000 520000 530000 540000 550000

5890000 5880000 5870000 5860000 5850000 5840000

Winisk Lake

Webequie

Bender Lake

Prime Lake

Muketeri River

McFaulds Lake

Proposed Mining Development

Legend

Route Preferred by Webequie Community

Winisk River Provincial Park

Webequie First Nation Reserve Limits

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Preliminary Preferred Corridor

Date: 2020-03-13	File Number: 649920	Sub Code: 0000
Figure Number: 5.4		Rev. 0

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5.3 Rationale for the Preferred Corridor Alternative

The rationale for selection of the Webequie community's preliminary preferred development corridor (Alternative 2C) to carry forward for more detailed identification and analysis of routing alternatives for the supply road in the EA is as follows:

- Advantage of intersecting fewer known traplines;
- Route is further east and away from significant hunting areas (e.g., waterfowl, moose, etc.) well used by community members;
- Runs east of areas used most intensively for traditional activities south of the community;
- Minimizes intersecting significant moose mating areas located south of the community and north of the proposed east-west section of corridor;
- Minimizes effects to known built heritage resources/cultural heritage landscapes (i.e., cabins, hunting blinds, sacred site);
- Minimizes impacts to Webequie First Nation Reserve lands;
- Minimizes the number of waterbody crossings required;
- Minimizes potential effects to fish and fish habitat, as it has fewer waterbody crossings and shortest route length where structures are required to cross waterbodies; and
- Has the lowest estimated capital cost for construction.

5.4 Development of Routing Sub-Alternatives within Preferred Supply Road Corridor

Since the geotechnical component is expected to have such a significant bearing on development, assessment and selection of the supply road route , during the winter of 2018-19, terrain mapping and related opportunities and constraints were overlain on an approximately 2 km wide band along the community's preferred corridor to identify a set of sub-alternatives. A summary of the preliminary terrain analysis and route assessment is presented in the following sections. Details of the preliminary terrain analysis and route assessment, identifying the optimal route from a geotechnical perspective, are provided in the Supporting Documentation package accompanying the ToR (refer to *Webequie Supply Road: Terrain Analysis, Potential Aggregate Sources & Identification of Route Alternatives, Draft Report* (J.D. Mollard and Associates (2010) Limited, March 29, 2019).

5.4.1 Initial Geotechnical Assessment - Terrain Mapping

Various existing data sources were compiled to interpret and map the terrain conditions within the preferred corridor to identify reasonable route sub-alternatives from a geotechnical perspective. Terrain mapping involved the interpretation of remotely sensed imagery and elevation data, supplemented with existing surficial geology maps, to characterize the landforms, surficial materials, topography, and hydrology.

Based on the terrain mapping, general geotechnical conditions and potential construction issues and risks were identified and assessed, including the characteristics of surficial materials that will form the roadbed foundation (including groundwater and permafrost conditions), availability of borrow and aggregates for construction, and topographic considerations to optimize vertical alignment and reduce cut/fill volumes. At the planning stage, this information can be used to help locate an optimum route centreline within the preferred corridor that respects engineering, environmental and socio-economic considerations.

5.4.1.1 Routing Considerations

In the context of the foregoing considerations, route location criteria included the following:

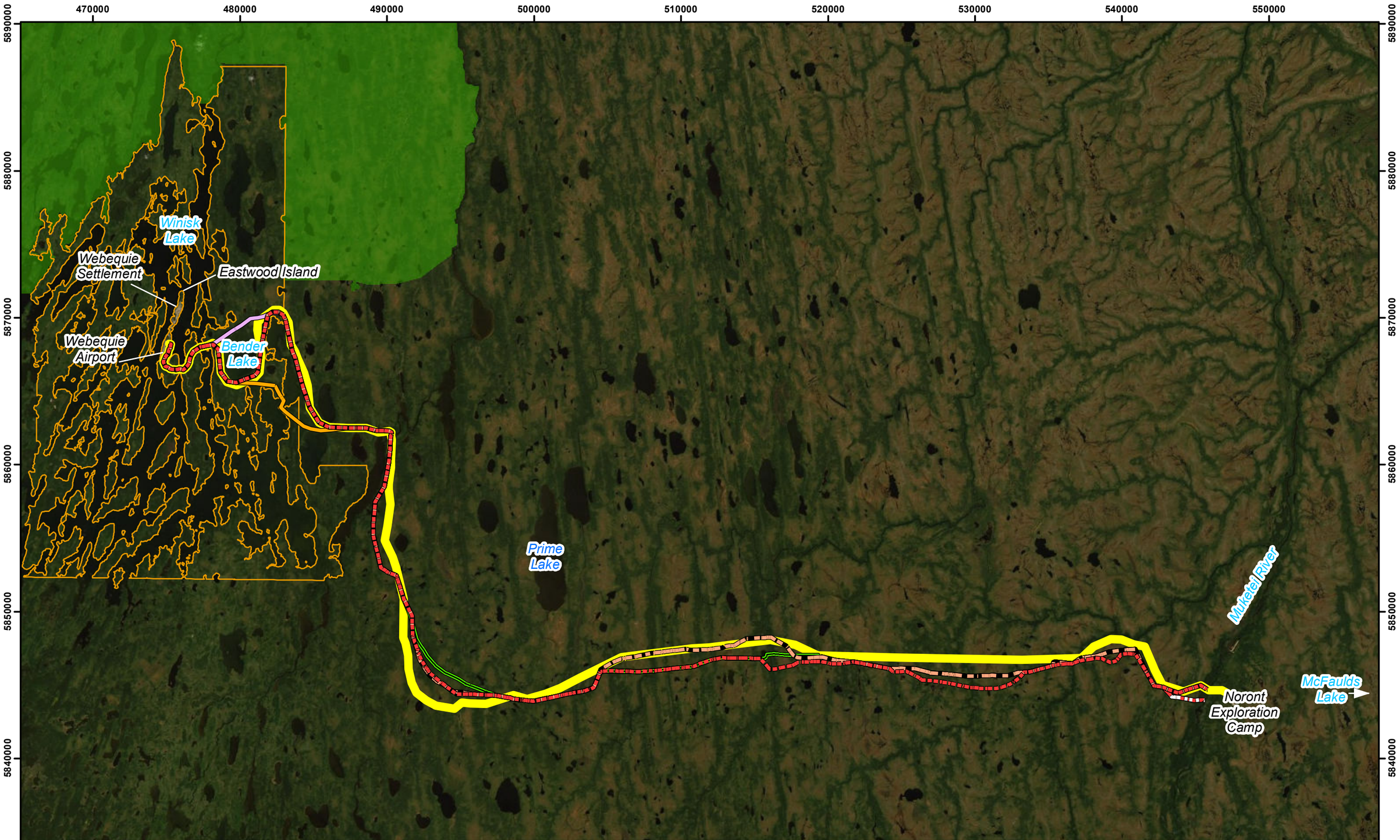
- Route length;
- Surficial material (mineral vs organic soils);
- Bogs and fens;
- Topographic relief and slopes;
- Availability of bedrock borrow (i.e., lack of borrow in some locations);
- Ice-rich peat bogs and fens;
- Extensive wetland and thermokarst-affected terrain;
- Wide river crossings; and
- Proximity to potential aggregate sources.

Route alternatives were identified with a view to: minimizing the total route length; following routes that maximize terrain units of favorable constructability (e.g., glacial till); minimizing traversing units of poor constructability (e.g., fens); minimizing the number and widths of stream crossings; and minimizing aggregate haul distances. While a shorter route is typically preferred, all other things being equal, there can be environmental, engineering, and economic advantages of an overall longer route that follows favorable terrain units and minimizes stream crossings. Terrain units with mineral soils are considered favorable for route construction, while those units with organic soils are considered unfavourable. Bogs are preferred over fens because bogs typically have a lower water table and thinner organic soil.

5.4.1.2 Alternative Routes

A total of six (6) alternative routes were mapped within the proposed preliminary corridor refer to **Figure 5.5**), each of which share various common segments and differ along other segments that offer advantages and disadvantages. Three (3) of the alternative routes differ only in the westernmost segments of the corridor around Winisk Lake and Bender Lake on the eastern approach to Webequie. Routes 1 and 2 diverge around Bender Lake, with Route 1 following a longer path around the south of the lake and Route 2 taking the shorter path to the north that requires a small channel crossing. East of Bender Lake, these routes both pass around the northern end of a long embayment of Winisk Lake. Route 3 cuts across a narrow portion of this embayment of Winisk Lake and passes to the south of Bender Lake, which results in a much shorter route, but requires a channel crossing over the embayment.

Routes 4, 5, and 6 share the same path east from Webequie and along the main north-south segment. These routes differ along the west-east segment that crosses the organic terrains and at the point of crossing the Muketei River. The challenge along this portion of the route corridor is avoiding the extensive fens and water crossings.



Legend

- Geotechnical Alternative 6
- Geotechnical Alternative 5
- Geotechnical Alternative 4
- Geotechnical Alternative 3
- Geotechnical Alternative 2
- Geotechnical Alternative 1
- Community Preferred Route
- Webequie First Nation Reserve
- Winisk River Provincial Park

WSR
WEBEQUIE
SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Route Alternatives for Geotechnical Assessment

Date: 2020-03-11	File Number: 649920	Sub Code: 0000
Figure Number: **5.5**		Rev. **0**

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5.4.1.3 Optimal Geotechnical Route

The optimal route from a geotechnical perspective (refer to **Figure 5.6**) was selected by picking segments from the six alternative routes that best meet the major criteria of route length, terrain conditions, stream crossings, and proximity to aggregate sources. The optimal route minimizes total length in two main locations. The first is in the area southwest of Prime Lake, where the corridor transitions from north-south to east-west at nearly a right angle. By crossing outside of the community's preferred corridor to the north, the optimal route cuts the overall length without adding additional water crossings. The second key location is around Bender Lake, where the optimal route crosses the shorter path northward around the lake. The second location (north around Bender Lake) was ultimately discounted in the optimal geotechnical route because it does not stand the test of avoiding the sensitive waterfowl staging area at this location.

The optimal route was selected to minimize the length of route crossing terrain units considered to have a poor constructability ranking, in particular the various types of fens that feature organic soils and a water table at surface. Overall, this results in a route that is south of the community's preferred corridor along the east-west extent and that lies outside of the corridor along a small portion of the route.

Other geotechnical information, such as the results of the ground penetrating radar (GPR) survey to assess peat thickness, and the geotechnical drilling program to assess road/bridge foundation conditions, will be considered in conjunction with the optimal route during the EA process to further refine routing and alignment assessments and inform design decisions.

470000 480000 490000 500000 510000 520000 530000 540000 550000

5890000 5880000 5870000 5860000 5850000 5840000

Winisk Lake

Webequie Settlement

Eastwood Island

Webequie Airport

Bender Lake

Prime Lake

Mukeiei River

McFaulds Lake

Noront Exploration Camp

Legend

- Optimal Geotechnical Route
- Community Preferred Route
- Webequie First Nation Reserve
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

Webequie Supply Road

Optimal Geotechnical Route

Date: 2020-03-11	File Number: 649920	Sub Code: 0000
Figure Number: 5.6		Rev. 0

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5.5 Project Infrastructure Alternatives

Figure 5.7 illustrates the location of the alternative routes in relation to project infrastructure and project area features and sensitivities. At this stage of project development, information pertaining to the location of construction infrastructure elements, such as temporary construction camps, aggregate source locations and access roads, is not available and will be determined following further engineering and environmental investigations, including determining how construction will be staged. However, it is anticipated that the alternative scenarios for such infrastructure will include the options described in Sections 5.5.1 and 5.5.2 below.

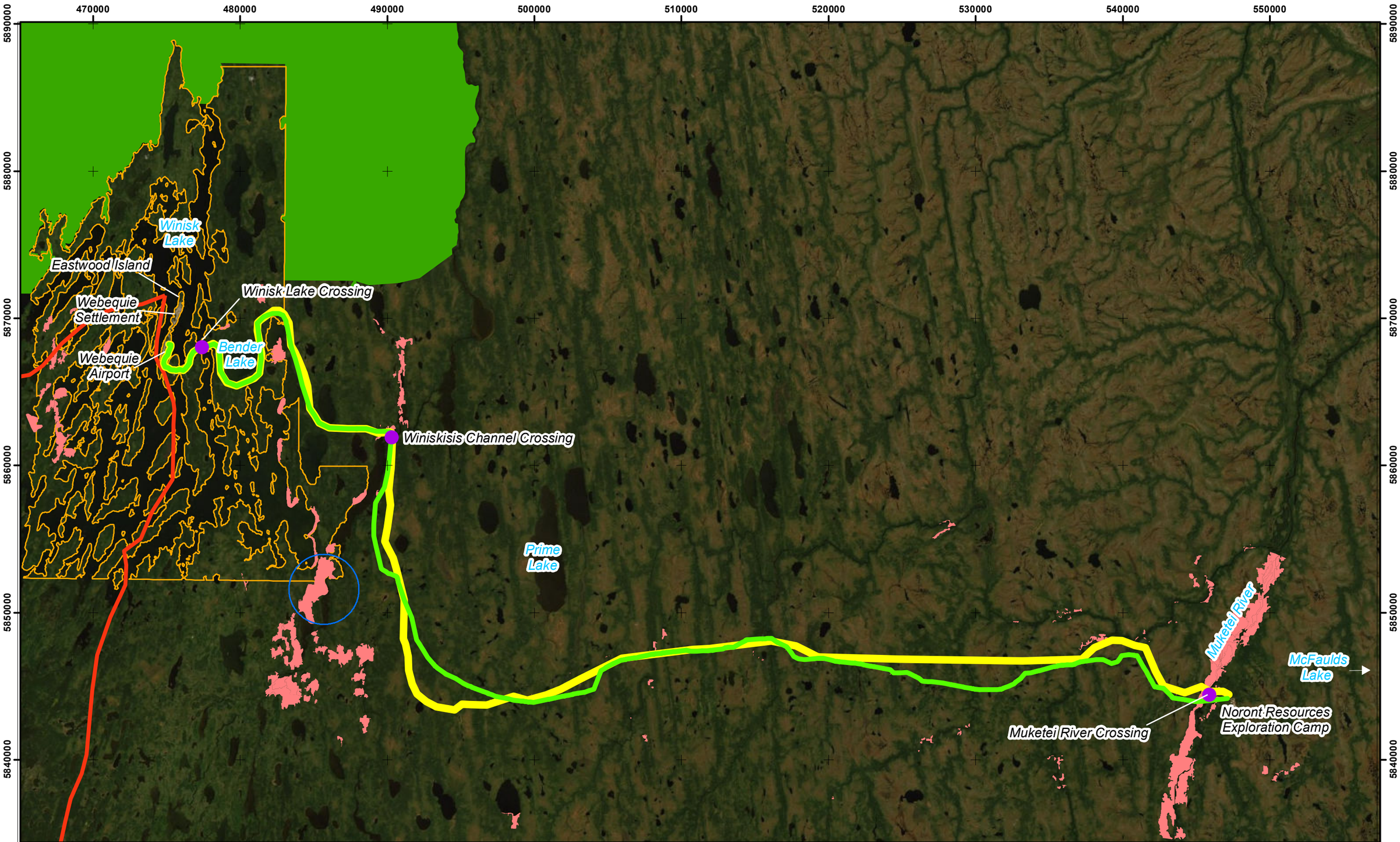
Similarly, due to confidentiality constraints (including those imposed by Webequie First Nation and Government of Ontario ministries), and the need to respect the wishes of potentially affected Indigenous communities with respect to divulging certain information on the use of lands in the project area, it is not possible to illustrate the location or bounds of a number of features and sensitivities, including First Nations' traditional territories, individual camps/cabins, species at risk incidence points, and government-regulated hunting areas (e.g., trapline licences). However, sensitive features and resources are described in general terms in Section 7 – Potential Environmental Effects.

5.5.1 Construction Camps

Accommodation for the construction work force for the Project will be provided through use of small, temporary construction camps (average workforce accommodation – 100). Construction camps are anticipated to be established in close proximity to the proposed road corridor. Options under consideration to accommodate the required construction camps are as follows:

1) As the project hub, the community of Webequie could also serve as the construction base camp. The full work force would be accommodated in temporary quarters there and deployed along the corridor on a daily basis.
2) The work forces may be accommodated at each end of the 107 km construction corridor (Webequie and Noront base camp area).
3) Work camps (estimate approximately 3) may be established at appropriate intervals/feasible locations along the construction corridor.
4) A combination of accommodation options 1 to 3 above.

In addition, it is likely that other supportive site facilities (i.e., laydown areas for materials and equipment storage/maintenance) will be established at appropriate/feasible locations along the construction corridor or located within the construction camps to maximize use of space and minimize impacts.



Legend

- Proposed Major Water Crossings
- Optimal Geotechnical Route
- Route Preferred by Webequie Community
- Existing Winter Roads
- Spring Water Source Location (Approximate)
- Potential Aggregate Sources
- Webequie First Nation Reserve Limits
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Project Area Features and Supply Road Alignment Alternatives

Date: 2020-03-13	File Number: 649920	Sub Code: 0000
Figure Number: **5.7**		Rev. **0**

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5.5.2 Aggregate Source Locations and Access Roads

The Webequie Supply Road is proposed to be built as close as possible to the natural terrain contours to limit the amount of earthworks and aggregate material required for the road surface. Construction camps, storage yards and temporary/permanent access roads will also be graded in a manner that minimizes the volume of aggregate needed for construction. Locally sourced aggregate will also be required to maintain and operate the supply road. The total quantity of aggregate required is unknown at this time and will be determined during the EA and preliminary design phase of the Project. Surface soils, such as till, are located throughout most of the north-south section of the proposed route of the road corridor, in parts of the east-west section, and in some isolated areas in the middle segment of the proposed road. Most of the middle part of the east-west section is organic deposits. Large amounts of till will be required as a part of earthworks to prepare the subgrade for the road construction. Till deposits are typically a sandy silt to silt matrix and would be suitable for subgrade construction. However, these deposits do not form any raised relief to use as major borrow sites; furthermore, the groundwater table is shallow. Therefore, the road construction may require smaller, frequently spaced borrows pits as they become available along the road.

There are number of aggregate sources locations that provide options for extracting the material needed for the Project. The location of these potential aggregate sources is presented in **Figure 5.7**. A general description and characteristics of the potential aggregate source locations are presented below.

Coarser till, eskers and bedrock are the available source options for aggregate. A limited number of boreholes have been drilled and sampled to date to fully characterize the extent and suitability of overburden and bedrock as aggregate sources, and only limited field observations were possible in 2018 to identify rock outcrops and assess borrow sources, due to snow cover conditions. Based on the data gathered to date, bedrock along the north-south section, consisting of strong, durable granitic rock, is an optional aggregate source and is at shallow depth. Esker formations of coarse till material are also a source option and are present along the north-south section and towards the ends of the east-west section of the proposed supply road corridor. A few bedrock outcrops observed along the east-west section of the supply road may also be suitable as an aggregate source. However, generally, given the absence of any high relief, and the shallow groundwater in the region, several borrow areas and quarries will require further evaluation in the EA to determine their potential for use.

Temporary and permanent access roads from aggregate source locations to the supply road corridor will be required during the construction and operation phases of the Project. Alternative routes for access roads will be considered in the EA, with the objectives of minimizing both haul route distances and adverse impacts to the environment.

5.6 Alternative Methods Carried Forward for Environmental Assessment

5.6.1 Webequie Supply Road Alternatives

The proposed set of supply road alternatives within the proposed preliminary corridor that will be subject to the environmental assessment is presented in **Figure 5.8**. These include the Webequie First Nation community's preferred route for the supply road (35 m right-of-way width) along the centreline of the approximately 2 km wide preliminary corridor and the optimal geotechnical route, also as shown in Figure 5.6.

The corridor between Webequie and the McFaulds Lake area has been divided into the following segments to provide flexibility in the ultimate selection of the preferred alternative, including the potential for development of additional sub-alternatives and combining segments from the community's preferred corridor and the optimal geotechnical route (or other alternatives that may be identified and developed for consideration).

Segment 1 – from Webequie Airport easterly, traversing the lands most intensively used by Webequie community members for traditional purposes.

Segment 2 – the north-south section and the bend connecting to the east-west routing alignment.

Segment 3 – the east-west section across the James Bay Lowlands area. Note: although the majority of the east-west leg of the Webequie Supply Road is coincident with the routing previously developed by Noront in consultation with WFN to serve the Eagle's Nest mine, due to the current status of the Noront proposal (EA is paused; revived EA is not expected to include an all-season road connection to the provincial highway network), this Webequie Supply Road segment should be considered as a separate project from the Noront road.

Segment 4 – the crossing of the Muketei River.

The initial options within each segment have been identified based on the two primary corridors that have emerged from the initial screenings – Webequie community's preferred corridor (C series) and the optimal geotechnical route based on terrain mapping (G series).

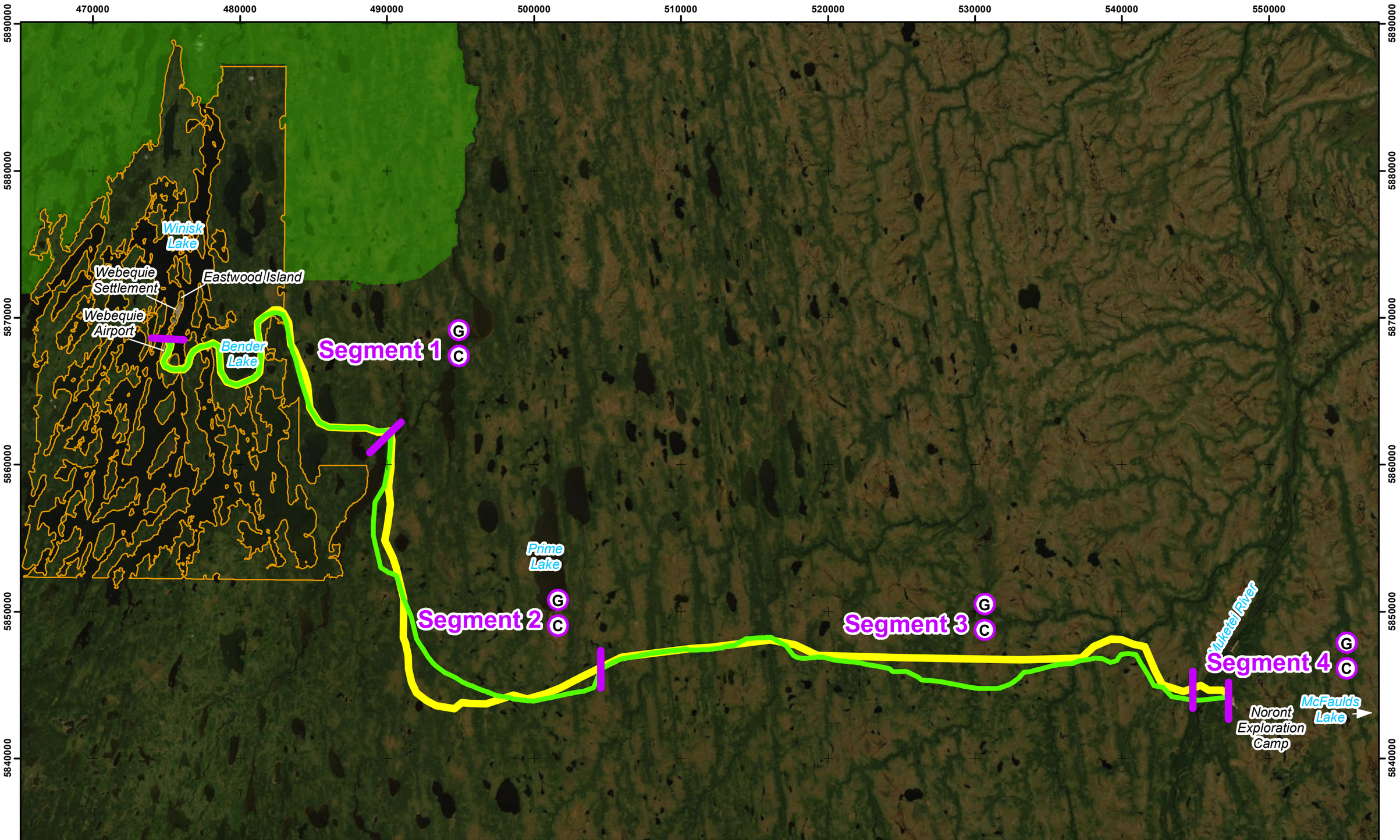
The proposed segmentation of the supply road corridor and the options within each segment will be subject to review and refinement during the environmental assessment process, including the identification and development of additional alternatives, as appropriate.

5.6.2 Project Infrastructure Alternatives

Pursuant to the discussion on project infrastructure alternatives in Section 5.5, the following alternative methods will also be included in the scope of the environmental assessment:

1) Alternative sites for temporary and/or permanent aggregate extraction pits and production facilities needed for construction and operation of the road, including access roads to these sites;
2) Alternative sites for supportive infrastructure (i.e., temporary laydown and storage areas, construction camps, including access roads to these areas);
3) Watercourse crossing structure types (i.e., culverts, bridges), span length, lifecycle, and construction staging methods at waterbody crossings;
4) Road attributes, including roadbed foundation; horizontal alignment, vertical alignment (elevation/profile), and adjustments to the cross-section and right-of-way (ROW) width of the corridor; and
5) Construction timing (seasonal) and staging along the ROW to facilitate construction and minimize potential effects on the natural environment and traditional Indigenous land and resource use.

In addition, as indicated in Section 5.1.1.6, the Do Nothing option will also be carried forward as a comparator in the EA study for the purposes of assessing the overall advantages and disadvantages of proceeding with the preferred method of implementing the Project.



Legend

- Optimal Geotechnical Route (G)
- Community Preferred Route (C)
- Webequie First Nation Reserve
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

Webequie Supply Road

Proposed Webequie Supply Road Alternatives Carried Forward to Environmental Assessment

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