

**RING OF FIRE
&
NORTHERN ONTARIO COMMUNITY
ALL-WEATHER ROAD ACCESS**

PRELIMINARY LOCATION & COST PROJECTION

Prepared For:

KWG Resources Inc.

Prepared By:



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CONTACT INFORMATION

Hartley Multamaki – Executive Vice-President
GreenForest Management Inc.

Email: hartley@gfmiontario.ca

Tel: (807) 343-6423
Cell: (807) 627-9859
Fax: (807) 343-6424

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INTRODUCTION

As part of efforts to develop the mineral potential in Northern Ontario's Ring of Fire and to potentially accommodate road-based access to several northern First Nation communities, KWG Resources Inc. (KWG) retained GreenForest Management Inc. (GFMI) to conduct a preliminary scoping exercise to locate an all-weather access road corridor and provide an associated cost projection. This scoping exercise focuses on the location of the most cost effective, feasible and efficient location of all-weather roads in the project area.

This is a high-level, "desk-top" exercise using publicly available information, such as terrain maps, imagery and forest cover information, complemented by GFMI's professional road access development expertise. This road corridor would travel from an existing all-weather road northeast of Pickle Lake, Ontario, in an easterly direction to the Ring of Fire area approximately 300 km north of Nakina, Ontario.

ABOUT GREENFOREST MANAGEMENT INC.

Based in Thunder Bay, Ontario, GFMI is a professional resource and environmental management firm that provides resource management; operational project planning, management and support; and environmental management services to both industry and government agencies. GFMI brings to this project its expertise in long-term road access planning in Northern Ontario. Its professionals have decades of experience in strategic and operational planning of primary access roads on Crown forests across Northern Ontario; and in the successful construction and maintenance of hundreds of kilometres (km) of roads and water crossing structures (culverts and bridges), including the Jackfish River, Root River and Brokenmouth River. A few examples of GFMI's staff experience in access and transportation infrastructure construction include:

- The planning, construction and maintenance of 700 km of primary all-weather roads north of Sioux Lookout, Ontario on the Lac Seul Forest for McKenzie Forest Products Ltd. This included the construction of the Slate Falls Road to the north from the Vermillion River Road 52 kilometres accessing the remote First Nation community of Slate Falls, Ontario. This included a major bridge crossing of the Brokenmouth River. This project was successfully completed in partnership with the First Nation community of Slate Falls; the Federal Ministry of Indian & Northern Affairs; the Ontario Ministry of Northern Development & Mines; and McKenzie Forest Products Ltd.
- The planning, construction and maintenance of 360 km of primary all-weather roads north of Nakina, Ontario on the Ogoki Forest for Long Lake Forest Products Inc. (The Ogoki Forest is immediately south of the road access project area.)
- Working with the Lac Seul First Nation, GFMI staff participated in the development and construction of primary road access, ferry terminals and the installation of a transport truck ferry service between the north and south shores of Lac Seul in Northwestern Ontario. This privately-operated ferry service facilitates an efficient transportation route for product delivery to the sawmill in Hudson, Ontario. This was a cooperative project between federal and provincial governments, Lac Seul First Nation and McKenzie Forest Products Ltd.
- Also with the Lac Seul First Nation, GFMI staff were involved with the construction of all-weather road access, a 23 metre Whitefish Bay Bridge & 250 metre causeway across Lac Seul to the Whitefish Bay Community. This work required approvals from the Federal Department of Fisheries and Oceans, Transport Canada, provincial government agencies; Stage 2 Cultural Heritage Assessment and an Environmental Screening Report for submission to Indian and Northern Affairs Canada.

The professionals at GFMI are experienced capital project planning, management, environmental assessment processes and compliance. They are proficient in approval acquisition, permitting for aggregate material extraction, water crossing construction, and addressing / mitigating impacts on identified values.

PURPOSES OF THIS EXERCISE

The purposes of this exercise and report were:

- To conduct preliminary scoping of an all-weather access road corridor location, originating from an existing all-weather road northeast of Pickle Lake, and travelling eastward to the Ring of Fire. This west-east main all-weather road corridor would link up with a previously KWG planned south-north corridor at a point between the Albany River and Attawapiskat River. The associated costs for construction and maintenance of the west-east corridor are projected. Based on discussions with KWG, the purpose of the all-weather road over the short term would be to access to the Ring of Fire area to facilitate the development of mine sites and the construction of mine infrastructure. Over the long-term, it would provide road-based access for service of and support of the mines.
- To conduct preliminary scoping of potential all-weather access road corridor locations to four First Nation communities in the area branching from the main all-weather road access to the Ring of Fire. The four communities are Eabametoong First Nation (Fort Hope); Neskantaga First Nation (Lansdowne House); Webequie First Nation and Marten Falls First Nation (Ogoki Post). The associated construction and maintenance costs for each of these community access road corridors are projected.
- To identify: a) the benefits associated to all-weather road access and the proposed locations for the mining development and First Nation communities; b) options for the execution of the road construction phase; c) other potential socio-economic benefits / opportunities for the region stemming from resource management activities; and d) other possible road access routes to First Nation communities not directly linked with the main all-weather access to the Ring of Fire.

It is important to note that the location of the road access corridor to the Ring of Fire and those of the branch road corridors to First Nation communities are preliminary in nature, based on publicly available soil, landform, topographic and vegetative information. Although reasonable care has been taken in the preparation of this report using the publicly available information, there is no guarantee as to the accuracy or completeness of publicly available information. In addition, environmental, social and cultural considerations, and potential values that may exist along the route(s) have not been considered in this exercise, and must be addressed appropriately in future planning through avoidance, protection and/or other mitigation measures.

PROJECT AREA

The Project Area for this report is relatively expansive, starting in the west at the Northern Ontario Resource Trail (NORT) Road, northeast of Pickle Lake. It projects eastward to the targeted Ring of Fire area – a distance of approximately 305 kilometres. Figure 1 illustrates the location of the project area, including the Ring of Fire and adjacent northern communities.

The western portion of the project area is situated on the *Ontario Shield Terrestrial Ecozone*. Adjacent to the NORT Road, the proposed start of the all-weather road, is the Aguta moraine system. This landform system is made up of a series of moraines and kames, which contain glacial till materials comprised of dry to fresh coarse-loamy and sandy soils.

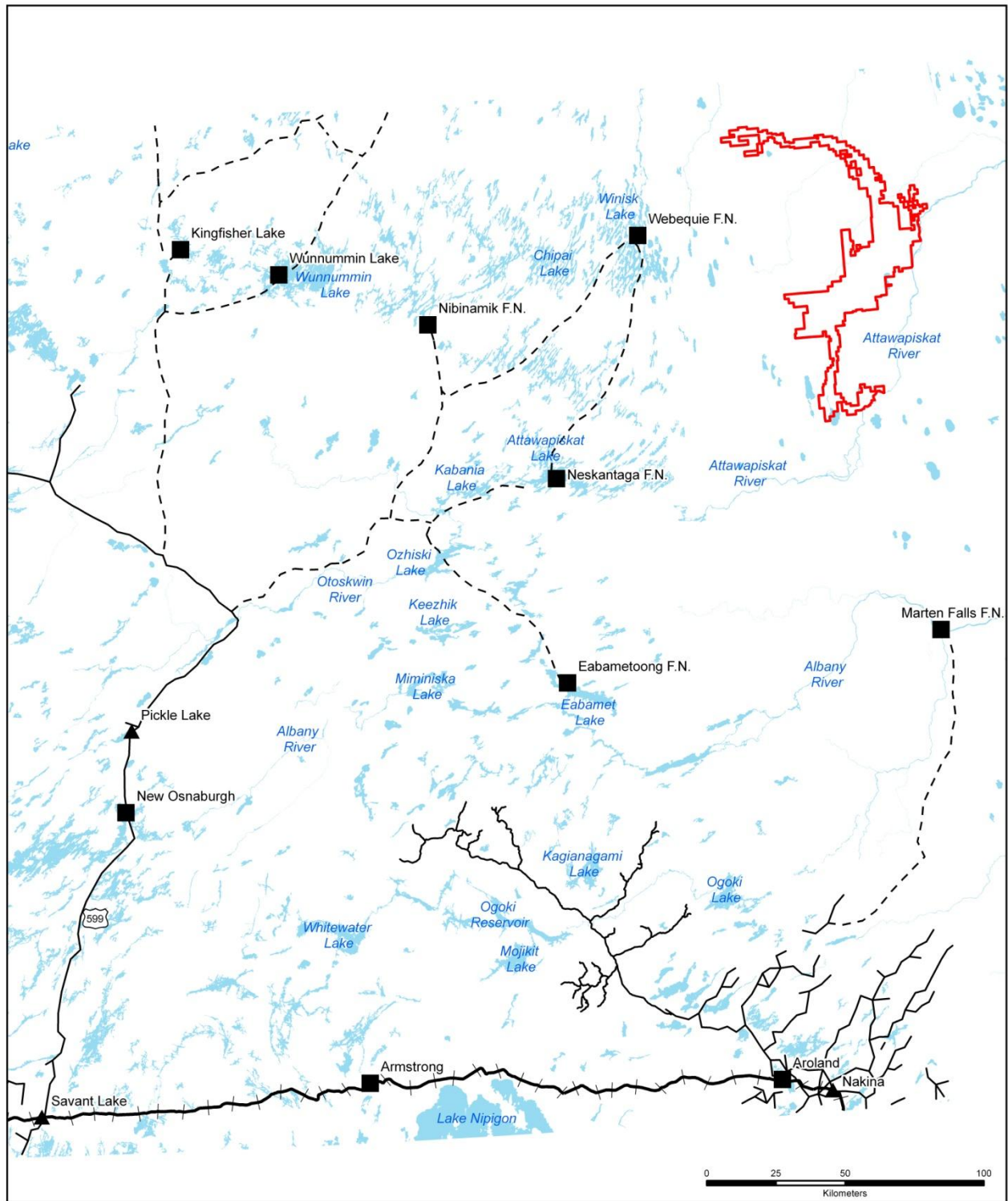


Figure 1. Location of communities and winter road access adjacent to the Ring of Fire project area .

There are a series of eskers that run in an east-west direction in conjunction with this moraine system. These eskers contain dry to fresh, stratified sandy and coarse-loamy soils. The presence of white birch and trembling aspen are good indicators of these landforms. Off the slopes of the moraines and eskers, a more level landscape exists consisting of undifferentiated glacial tills containing sands and silty-sand soil mixes. The topography changes very subtly in these lower areas and occurrences of more moist soils to pockets of organic material greater than one meter in depth are possible. The presence of jack pine and balsam fir will be helpful in identifying areas that are not deep organic sites, although pure black spruce stands will occur in these sites as well. Also scattered throughout the project area are drumlins, which may provide suitable aggregate materials. There are also areas dominated by bedrock, which is comprised of undifferentiated igneous and metamorphic rock. The bedrock is not always visible at the surface, due to coverage by mineral or organic soil.

In the eastern and northeastern portion of the project area where the Ring of Fire is located, the Ontario Shield ends, and the *Hudson Bay Lowlands Terrestrial Ecozone* begins. This region is predominantly organic soils (peat, muck and marl) with an abundance of black spruce and tamarack growing on these sites. There is an esker/moraine complex that runs in a north-south direction, as well as some morainal deposits at the edge of the lowland area, on which the KWG has previously scoped a south to north road / railway corridor.

PROPOSED ROAD CORRIDORS

PROPOSED RING OF FIRE ACCESS ROAD CORRIDOR LOCATION

GreenForest Management Inc. does not advise that existing winter roads be the basis for the construction of all-weather access roads unless it is absolutely necessary or unavoidable. Existing winter roads and alignments generally are not compatible with all-weather road construction requirements because they are normally located in low, flat wet terrain that will facilitate rapid and deep freezing and easy maintenance. As such, the guiding principles for this road corridor and cost projection exercise were:

- Find the most direct route from the NORT Road east to the Ring of Fire
- Optimize the location of branch access roads to as many First Nations communities as possible from the main west to east corridor
- Maximize use of upland terrain and the sourcing of road building materials, and to avoid as much swamp and muskeg as possible

As illustrated in Figure 2, a west to east all-weather access corridor has been located using available soil, landform, topographic and vegetative information for the project area. The proposed start location is from the Northern Ontario Resource Trail (NORT) Road, 60 km northeast of Pickle Lake (Point A). The road corridor travels in a generally easterly direction, between Eabametoong First Nation, and Neskantaga and Webequie First Nations, for a distance of approximately 218 km, linking up with a previously KWG planned south-north corridor between the Albany River and Attawapiskat River (Point B). The road corridor then turns north for approximately 86 km, following a morainal complex along the edge of the Hudson Bay Lowland to the KWG's target location (Point C).

For the most part, the road corridor presented takes advantage of high ground and is located on or is proximate to morainal and esker landforms that can be expected to supply aggregate for road building. These are very difficult road building conditions, dominated by streams, lakes and swamps, particularly as one travels towards and into the Hudson Bay Lowlands. In the absence of detailed field information, the corridor is planned in the most feasible location.

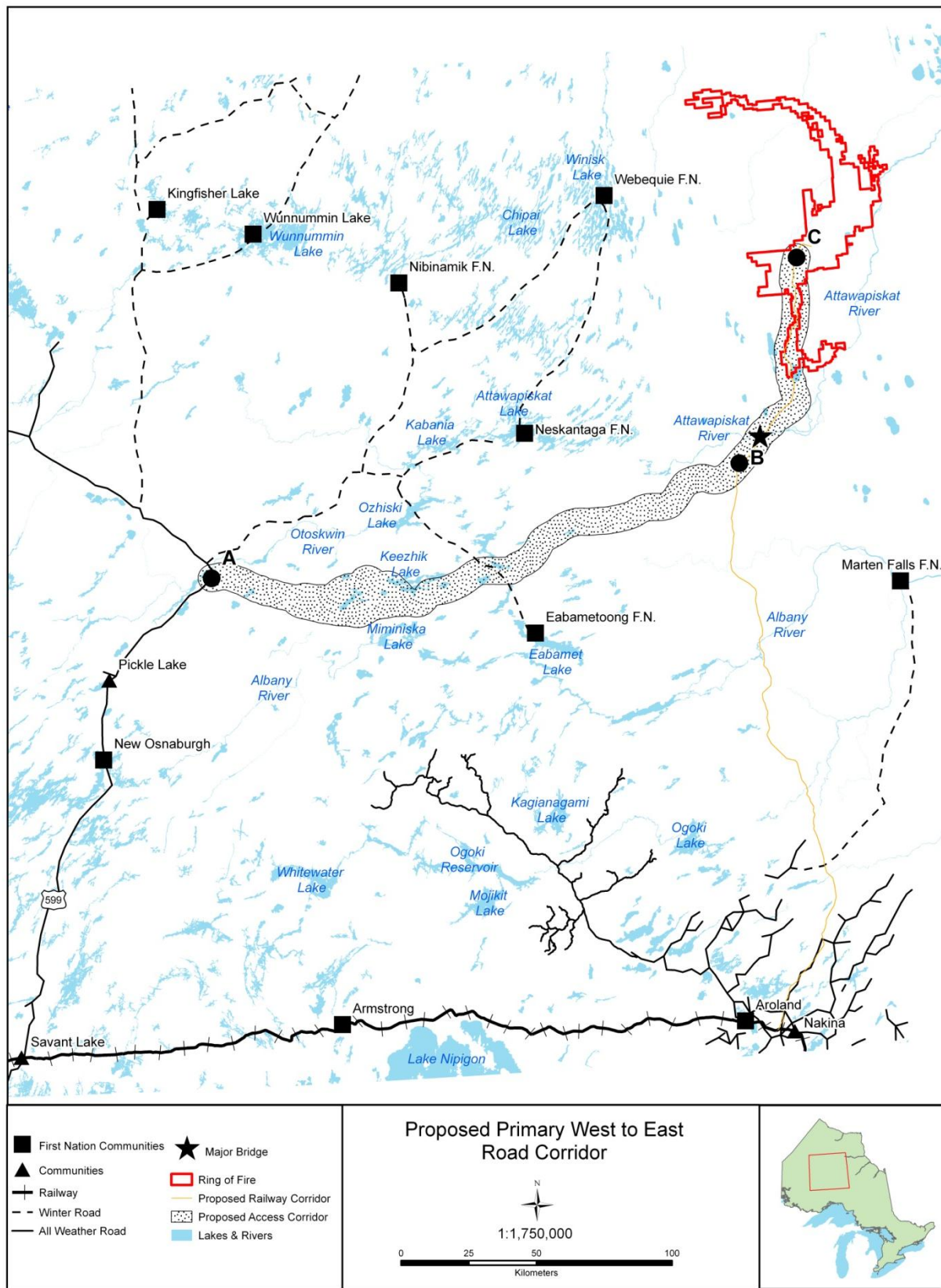


Figure 2. Proposed primary all-weather corridor to the Ring of Fire.

The total length of the main access corridor (Route A-B-C) is approximately 304 km, with a major bridge across the Attawapiskat River. This major bridge crossing would involve both road and railway infrastructure.

POTENTIAL COMMUNITY ACCESS ROAD CORRIDOR LOCATIONS

There are four northern remote First Nation communities that may potentially benefit directly from the west to east all-weather road access to the Ring of Fire. The potential exists for all-weather access roads to be constructed to the communities if they so chose to be connected with the road network. At a minimum, the existence of an all-weather road through the project area would dramatically reduce the distance of winter only roads to the respective communities. Potential branch road corridors have been scoped to the respective reserve boundaries of the four First Nation communities, which are illustrated in Figure 3.

1) Eabametoong First Nation (Fort Hope)

The Eabametoong First Nation is situated on the northern shore of Eabamet Lake, which is part of the Albany River watershed. It is located 365 kilometres north of Thunder Bay, Ontario. This remote northern community has an on-reserve population of 1,300 and is accessed by winter snow and ice road. Year round air access is available. The potential road corridor **E1**, branches off at approximately Km 120 of the main all-weather corridor, and travels southward a distance of approximately 13 km to the community. The road construction conditions for this route are reasonable with respect to upland construction and likely availability of road material.

Two other all-weather access road options to Eabametoong First Nation, **E2** and **E3**, south to Nakina are discussed later in this report. These two other options are not directly linked with this Ring of Fire road corridor scoping exercise, but a south to north road could connect with the proposed road network in the project area.

2) Neskantaga First Nation (Lansdowne House)

The remote fly-in Oji-Cree First Nation community of Neskantaga is located on the southern shore of Attawapiskat Lake, approximately 434 kilometres north of Thunder Bay, Ontario. In the winter months, access is available via winter snow and ice road to points south, connecting to the Northern Ontario Resource Trail northeast of Pickle Lake. As of November of 2011, there was a total registered population of 414 people, of which 304 people live on-reserve. The potential road corridor **N1**, branches off at approximately Km 138 of the main all-weather corridor, and travels northwest a distance of approximately 39 km to the community. The road construction conditions for this route are reasonable with respect to upland construction and likely availability of road material.

3) Webequie First Nation

The Ojibway community of Webequie is located on the northern peninsula of Eastwood Island on Winisk Lake, which is 524 kilometres north of Thunder Bay, Ontario. Access to the community is by air or winter snow and ice roads, connecting to the Northern Ontario Resource Trail northeast of Pickle Lake. The community has a population of approximately 600 people. As the community is located on an island, the potential road access corridor has been scoped only to the shore of the lake.

One potential road corridor **W1**, branches off at approximately Km 196 of the main all-weather corridor, and travels northward a distance of approximately 90 km to the south shore of Winisk Lake. Although the most

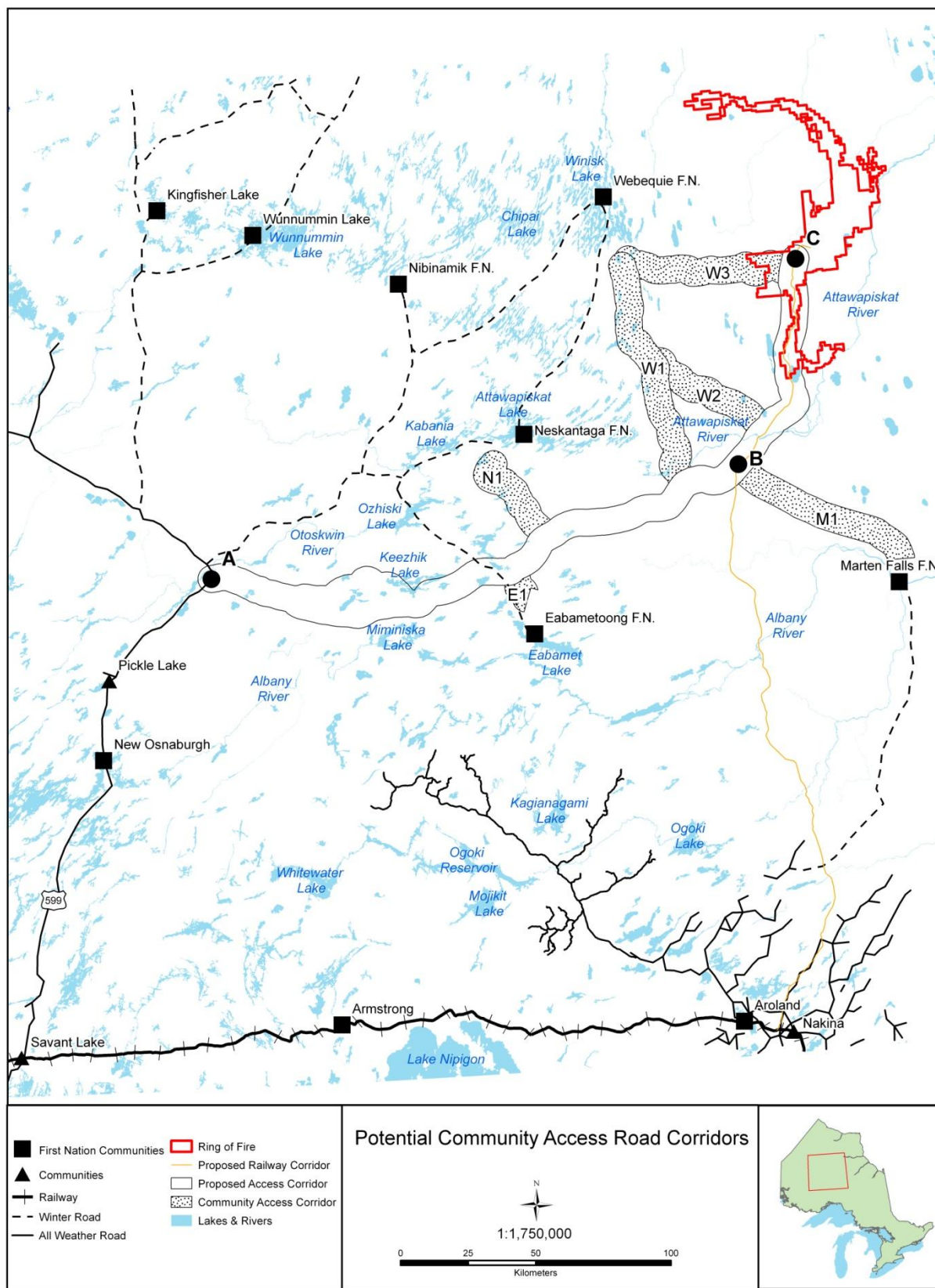


Figure 3. Proposed primary all-weather corridors to the four First Nation communities.

direct option from the main all-weather road, this route would require a major bridge across the Attawapiskat River.

A second potential road corridor, **W2**, branches off at approximately Km 233 of the main all-weather corridor, and travels northwest a distance of approximately 52 km, linking up with corridor **W1**, to the south shore of Winisk Lake. Similar to corridor **W1**, this route would be approximately 92 km from the main all-weather road, but would utilize the bridge which all ready needs to be constructed across the Attawapiskat River in Section B-C of the main road to the Ring-of-Fire. Furthermore, the **W2** corridor is modestly closer to the mine site.

A third potential road corridor, **W3**, would travel west from the main access road to the Ring of Fire (at approximately km 304) to Webequie, across extremely swampy muskeg conditions for 60 km. This branch road corridor would provide a direct link to the mine(s), and is relatively short compared to **W1** and **W2**. However, it would be a considerable distance from the community to the start of the main access road northeast of Pickle Lake (approximately 364 km).

More detailed field information would be necessary to ascertain which route to Webequie First Nation (via **W1**, **W2** or **W3**) would have the highest benefit to the First Nation. In the absence of detailed geotechnical information for the potential bridge crossing on corridor **W1**, GFMI has incorporated a general cost estimate for this structure.

A fourth all-weather access road option to Webequie First Nation from the west is discussed later in this report. This fourth option is not directly linked with this Ring of Fire proposed road corridor scoping exercise. However, it could offer all-weather access to Pickle Lake and indirectly to the Ring of Fire developments.

4) Marten Falls First Nation (Ogoki Post)

Marten Falls First Nation community is located at the junction of the Ogoki and Albany Rivers (north shore), approximately 436 kilometres northeast of Thunder Bay, Ontario. Year-round access to the community is by air. Marten Falls operates a winter snow and ice road to transport bulk freight like construction materials and fuel for commercial purposes into the community. Marten Falls First Nation has a membership of 650+, with approximately half of the population residing on-reserve.

The potential corridor **M1**, branches off at approximately Km 218 of the main all-weather corridor, and travels southeast a distance of approximately 71 km to the community. The road construction conditions for this route will be very difficult, as it is almost all lowland swamp construction conditions, with likely no readily available road construction material. The road will need to be floated across the muskeg conditions.

A second all-weather access road option, **M2**, leading west and south to Nakina is discussed later in this report. This other option is not directly linked with this Ring of Fire road corridor scoping exercise, but a road southward could connect with the proposed railway corridor and any associated service road.

PROPOSED ROAD CONSTRUCTION STANDARDS & EXPECTED CHALLENGES

PROJECTED PRIMARY ACCESS ROAD AVAILABILITY

With respect to the availability for use of the primary all-weather west to east access road, GFMI foresees no significant restrictions for passenger, light truck and service-sized vehicular traffic. Winter snow storms or freezing rain may result in a modest reduction in the availability of use of the main road (perhaps 5% per year). Having snowplows (truck-type) and sanders strategically located in four to six locations along the route would result in relatively quick winter storm response (50-75 km winter maintenance segments).

There are MTO load restrictions of 5,000 kg per axle from March 1 to May 31, imposed on Hwy 599 from Silver Dollar to Pickle Lake. Unless trucks / trailers are equipped accordingly, this will impact heavy load transportation to and from the Ring-of-Fire area via the proposed all-weather road for 25% of the year. GFMI would recommend that the managers of the all-weather road consider similar load restrictions during spring break-up to minimize road damage and annual maintenance costs.

Conservatively-sized culverts and bridge openings will reduce / mitigate the potential for washouts and winter culvert freeze-up, and over the long term, would reduce annual repair and maintenance costs.

PROPOSED ROAD CONSTRUCTION STANDARDS

Based on discussions with KWG, the purpose of the all-weather road over the short term would be to access to the Ring of Fire area to facilitate the development of mine sites and the construction of mine infrastructure. Over the long-term, it would provide road-based access for service of and support of the mines. In addition, it could serve as the primary artery to branch roads to adjacent First Nation communities.

For the main west-east access road (Route A-B-C), GFMI proposes an all-weather construction specifications (Table 1) similar to that used for primary industrial resource access roads elsewhere in the province to provide principle access to forests, communities and government / industrial facilities. Vehicle weights up to approximately 80,000 kilograms can be accommodated.

Table 1. Geometric specifications for resource access roads.

CLASS	ROW Clearing (m)	Speed (kph)	Roadway Width (m)	Horizontal Curvature (m radius)	Max. Gradient (%)	Min. Sight Dist. (m)	Min. Ditch Depth (mm)	Min. X-Culvert Size (mm)	Max. Aggregate Size (mm)	Granular Structure (mm)
A	30-60	60-80	8-9	290	6-8	180	600	600	40	300-400
B	20-60	40-60	6-8	218	10	100	300	450	70	200-300

Field investigation will be necessary to determine quality and quantity of road building material available for road construction; however a Class A road, or combination of Classes A and B, would meet the short and long-term support and service objective for the Ring of Fire developments. The importation of optimal materials for road construction may be cost prohibitive. It is a possibility that the branch roads to the adjacent First Nation communities need not be to the same construction standard as the main all weather road artery, if it the anticipated traffic / load level is lower.

EXPECTED ROAD CONSTRUCTION CHALLENGES

Based on the available information, the general level of difficulty and associated cost of road construction in the project area increases as one travels from west to east. The availability of road construction material and aggregate decreases as the construction enters the Hudson Bay Lowland region approximately 200 km from the main all-weather corridor start northeast of Pickle Lake. Aggregate sourcing and importation is expected to be one of the highest cost components, and it has been assumed that it can be sourced within a reasonable distance.

Supported by further field study, construction options across unavoidable lowland wet areas can be put forward. Newer technologies are emerging to solve lowland muskeg road access issues elsewhere in Canada. However, in the absence of detailed information such as organic soil depths, GFMI is providing an estimated cost based on its experience under these construction conditions. There will be numerous water crossing structures (culverts, bridges) along the A-B-C route to the KWG target in the Ring of Fire, with a major bridge crossing of the Attawapiskat River.

There will be over-arching logistical challenges for the construction of the main all-weather access and for the potential branch access roads to the communities. Heavy equipment, a skilled workforce or the training of one, and necessary support services, such as camp accommodations, food, fuel, building materials and heavy equipment services will need to be coordinated.

A staged approach to the construction of the main and potential branch corridors is an opportunity to alleviate some of these challenges. By having the construction occur simultaneously from the start of the main access road in the west, as well as from the First Nation communities along the route, the following benefits may be realized:

- Workers can be trained/employed in the location, right-of-way clearing and preparation of road access along the main road and branch community roads;
- Workers can be trained/employed in the use of and service of heavy equipment, and in road construction techniques –skills transferable to mining and other sectors;
- Workers can live in their communities during the road construction phase;
- Road construction material can be sourced, stockpiled for delivery in the most cost effective manner.

PROJECTED ROAD CONSTRUCTION & MAINTENANCE COSTS

Road construction cost estimates include planning and road location, water crossing structure, project management and a budget for First Nation community consultation. Not included is potential cultural heritage or archaeological survey costs; or the costs associated with Environmental Assessment. Annual road maintenance costs include summer grading, spot surfacing, dust control, ditch maintenance, roadside brush control and winter plowing/sanding. Figure 4 illustrates the proposed all-weather road corridor locations and the projected construction costs.

PRIMARY RING OF FIRE ACCESS ROAD COSTS

Table 2 presents the projected road construction cost range estimate for the main all-weather road access to the Ring-of-Fire, west from Pickle Lake. As previously described, the main corridor has been broken down into two sections; A-B and B-C. Approximate road lengths and associated costs are provided for each section and for the entire length of Route A-B-C. The projected construction cost range, including the large bridge

construction across the Attawapiskat River, is \$83.6 million to \$99.9 million (KWG's estimate for the Attawapiskat River bridge, accommodating both road and railway infrastructure is \$40 million).

Annual maintenance costs for the main all-weather road to the Ring-of-Fire are projected to range from \$4.2 million to \$6.1 million.

Table 2. Projected construction cost range for the primary all-weather Ring-of-Fire road.

Projected Cost (\$ millions) of Primary All-Weather West to East Road to the Ring of Fire			
Road Section / Route	Distance (km)	Construction Cost Range	
		Low	High
Section A-B	218	\$ 27.5	\$ 41.1
Section B-C	86	\$ 16.1	\$ 18.8
Total Route A-B-C - Excluding Attawapiskat R. Bridge	304	\$ 43.6	\$ 59.9
Total Route A-B-C - Including Attawapiskat R. Bridge	304	\$ 83.6	\$ 99.9

POTENTIAL COMMUNITY ACCESS ROAD COSTS

Table 3 presents the projected road construction estimates for all-weather roads to each of the four First Nation communities, branching off from the main all-weather access road to the Ring of Fire. It is projected that the construction costs for approximately 200 km all-weather access to the four communities would range from \$36.1 million to \$73.1 million (depending on which route to Webequie First Nation is selected).

Annual maintenance costs for the four all-weather access roads to the four communities are projected to range from \$1.4 million to \$2.6 million.

Table 3. Projected construction cost ranges for the potential community all-weather access roads.

Projected Cost (\$ millions) for Potential All-Weather Access Roads to the Communities			
Road Section / Route	Distance (km)	Construction Cost Range (\$M)	
		Low	High
E1 - Eabametoong First Nation	13	\$ 1.5	\$ 2.1
N1 - Neskantaga First Nation	39	\$ 4.9	\$ 6.1
W1 - Webequie First Nation	90	\$ 39.2	\$ 44.8
W2 - Webequie First Nation	92	\$ 21.6	\$ 27.4
W3 - Webequie First Nation	60	\$ 14.0	\$ 17.8
M1 - Marten Falls First Nation	71	\$ 15.7	\$ 20.1

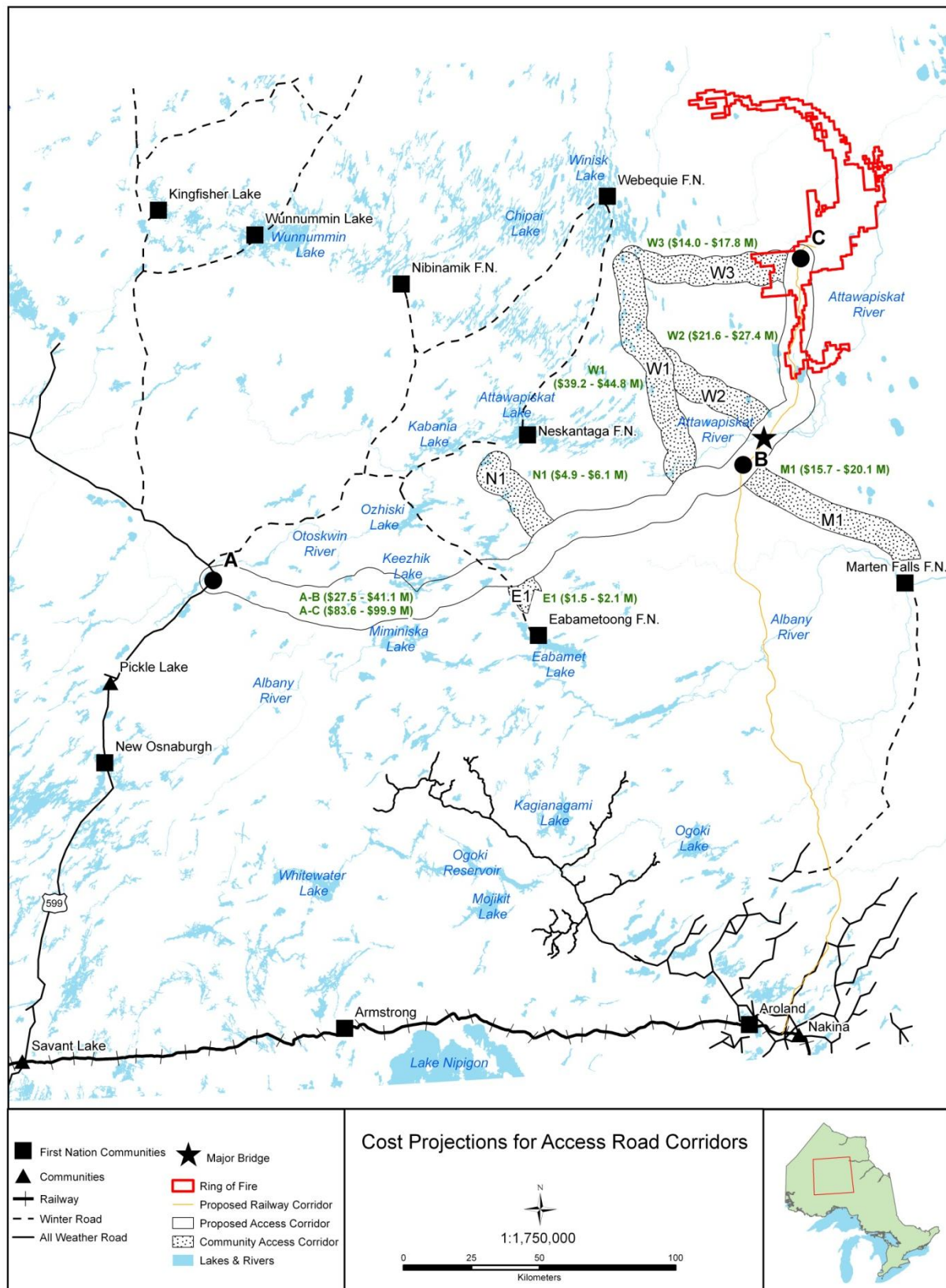


Figure 4. Proposed all-weather road corridor locations & projected construction costs.

SOCIO-ECONOMIC BENEFITS

The potential socio-economic benefits and opportunities resulting from the construction of a west-to-east year round access road are potentially quite significant. Currently, year round access to northern First Nation communities is restricted to air service, which is an expensive transportation alternative for freight and community members. Access by air is supplemented in the winter months by a network of snow and ice roads, which appears to be becoming increasingly unreliable as a consequence of warmer winter temperatures; requires extensive planning and coordination of goods transportation; and significant capital in the preparation and operation of the winter road – an investment which literally melts away annually.

The socio-economic benefits and opportunities range from short to long term for First Nations communities in the project area. Specifically short term and direct benefits that can be expected include:

- Heavy equipment and road construction training and skill development
- Employment on road construction and maintenance
- Employment in road construction support sectors, such as equipment parts and service, fuel supply, food and housing and equipment service centres
- Need for a road network management company, to provide road maintenance and monitoring services

Most short term benefits are the foundation for transferable and lasting benefits to northern First Nation communities. The following longer term socio-economic benefits potentially could be expected from all-weather road access to communities, including:

- Increased opportunities for local and regional-based employment, particularly associated with mining development at the Ring of Fire through an established road network
- Transfer of road construction and equipment use skills to mining and other resource management and equipment operation sectors (construction, energy, forestry)
- Expansion and improvement in health care delivery, including dental, home and long-term care services
- Increased travel options for health care purposes
- Improvement and expansion in delivery of government and social services
- Improved response time for police services
- Lower cost of living through ground-based delivery of goods and services
- Lower cost of personal travel
- Increased ability to access basic services (e.g. food, vehicle repair, clothing) and professional services (e.g. financial, legal, commercial)
- improvement in the delivery of educational services on First Nation communities (e.g. establish secondary schools thus eliminating need for placement of students out of community)
- Reduction in airport maintenance costs
- Development of new remote, resource-based tourism ventures

Even if a community chose not to become linked to the main all-weather road network, many benefits can still be realized through reduced costs and shorter winter road lengths.

OTHER POTENTIAL OPPORTUNITIES

With the establishment of an all-weather road access in the project area, the potential for future economic development beyond mining sector is significant. Development opportunities have been scoped under other initiatives elsewhere in Ontario, with in First Nation communities taking the lead. These development opportunities, which would foster greater economic independence for First Nation communities, include:

- Land use management and development, such as the creation of forest management units for the management and use of wood supply
- Establishment of harvesting operations to supply small scale sawmills to furnish lumber for local housing construction and to the mine developments
- Construct cogeneration plants with wood biofuel for energy production at the communities, reducing dependence on fossil fuels, and potentially supplying cogeneration facilities at the mines
- Remote based tourism expansion in the north
- Growth of industrial, mechanical, transportation, commercial, financial, legal and health services sector

OTHER ACCESS OPTIONS TO COMMUNITIES IN THE PROJECT AREA

Figure 5 illustrates other options that would facilitate road access to the communities of Marten Falls and Eabametoong within the project area. Preliminary locations for these access routes have been identified, but costs have not been projected.

Marten Falls First Nation (Ogoki Post)

With respect to Marten Falls First Nation, even with the access corridors as proposed (via Route M1), it is a very lengthy travel distance west to Pickle Lake. It may be more desirable for the community to have direct access southward, to the Municipality of Greenstone and Thunder Bay. Another second option, **M2**, would be to construct an all-weather road along the north bank of the Albany River west for 82 km, intersecting with the proposed KWG-Canada Chrome Corporation railway line corridor. The proposed railway line corridor originates in Nakina and travels north to the Ring of Fire. Rail service to the Ring of Fire or south to Greenstone is an option, as is an all-weather service road from Nakina to the Albany River (167 km).

Eabametoong First Nation (Fort Hope)

Two other options exist for road access to Eabametoong First Nation other than the proposed access (via **E1**). It may be desirable for the community to have more direct access southward to Nakina, the Municipality of Greenstone and Thunder Bay. Existing roads on the Ogoki Forest could be extended north toward Eabametoong First Nation. New construction would range from 70 km for option **E2** to 74km for option **E3**, to the community boundary. Both routes however would require a significant bridge or ferry system across the Albany River. At a minimum, a winter road could be constructed north from these all-weather roads to service Eabametoong FN.

The construction of one of these all-weather road options, even partially, could support the previously discussed staged construction approach of the main all-weather road to the Ring of Fire, as equipment and support could be moved to Eabametoong First Nation more readily.

Kingfisher, Wunnumin Lake, Nibinamik and Webequie First Nations

Although not directly linked to the proposed main all-weather access road from Pickle Lake to the Ring of Fire, the feasibility of two other potential all-weather access routes have been examined, that could provide all-weather access to Kingfisher, Wunnumin Lake, Nibinamik and Webequie First Nations, accessed via the NORT Road north of Pickle Lake. This access road potential, if connected through Webequie, would provide access to the Ring of Fire developments. Considerably more investigation of these options is required for cost projections and corridor identification.

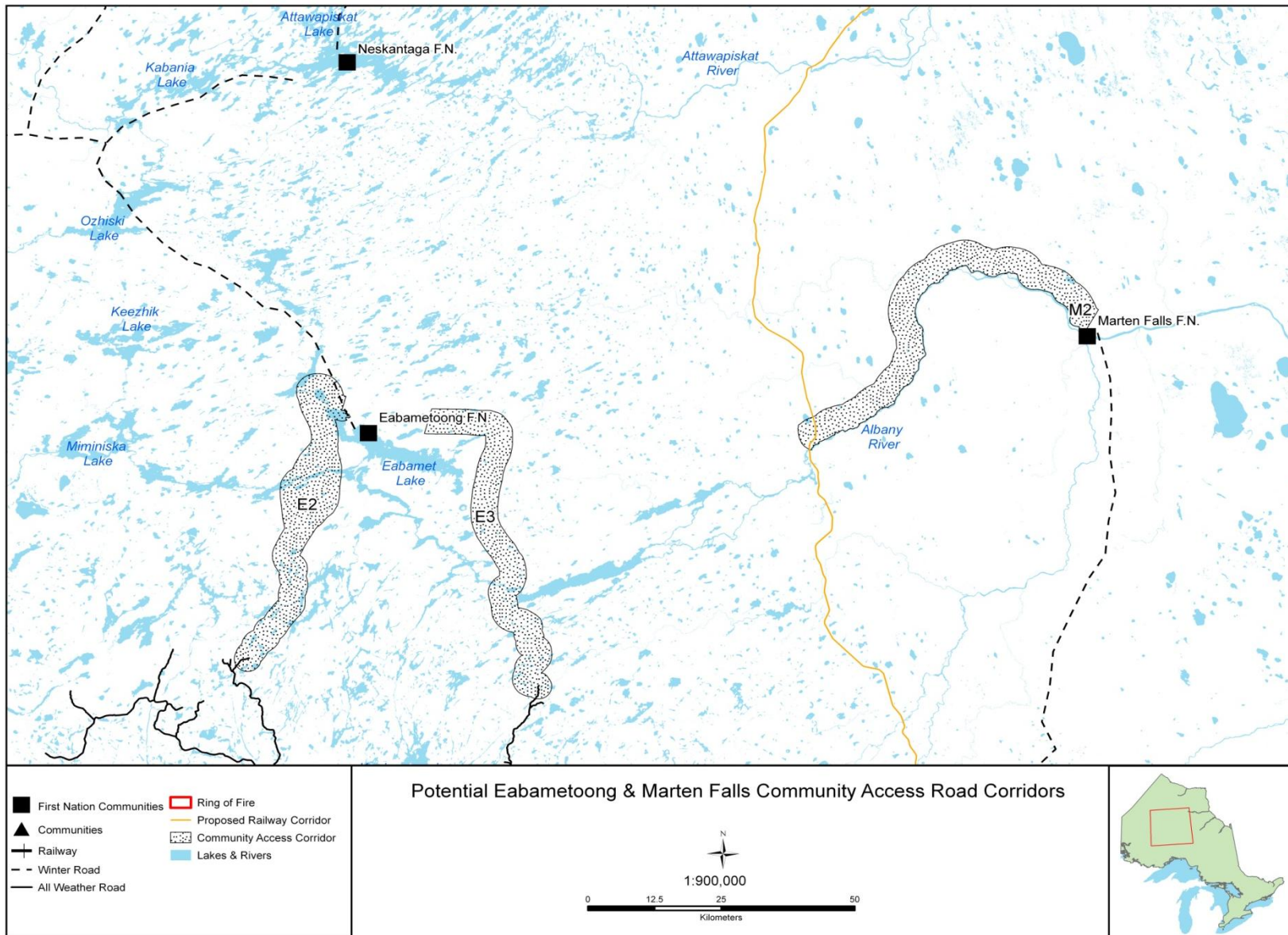


Figure 5. Other options for all-weather access to Marten Falls and Eabametoong First Nation communities.

CONCLUSION

A proposed main all-weather road location has been scoped west from Pickle Lake to the Ring of Fire region. This road would be constructed to a standard that would facilitate access for mine site development and support mining operation over the long-term. The projected construction cost range, including the large bridge construction across the Attawapiskat River, is \$83.6 million to \$99.9 million (KWG's estimate for the Attawapiskat River bridge to accommodate road and railway infrastructure is \$40 million). Annual maintenance costs for the main all-weather road access to the Ring-of-Fire are projected range from \$4.2 million to \$6.1 million.

The proposed main all-weather road location is proximate to four remote First Nation communities. The potential exists to connect each of these remote communities via all-weather access roads, which, if they so chose, would dramatically reduce the current high costs of goods and services being delivered. It would also increase opportunities for local and regional-based employment, particularly associated with mining development at the Ring of Fire through the established road network. It is projected that the construction costs for approximately 200 km of all-weather road to the four communities would range from \$36.1 million to \$73.1 million (depending on which route to Webequie First Nation is selected). Annual maintenance costs for the four all-weather access roads to the four communities are projected range from \$1.4 million to \$2.6 million.

As discussed, a staged approach to the construction of the main all-weather access to the Ring of Fire from both the starting point in the west and from the communities along the main route, would be beneficial in that it could provide immediate employment opportunities, training of workers in skills transferable to mining development, and expedite the construction of the road. With the support of the critical parties, planning and permitting for the main all-weather access road could be completed in 2014, and actual construction operations could commence in 2015.